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ILLUSTRATIONS.

Fine Art Exhibition Building, York (Plan, 513).—Mr. Edward Taylor, Architect 514

The Sydney International Exhibition Building.—Mr. James Barnet, Architect 515

CONTENTS.

Architecture and General Art in Unity and Sympathy 501
The Royal Academy Exhibition 502
Architecture at the Royal Academy 504
The Mosque of Cordova 505
Comparative Cost of Labour in England and in Japan 506
Conditions of Life in India 507
The Goldsmiths of Mediæval France 508
A Collection of Reputed Cases relating to Architects, Surveyors, and Builders 509
The Iron and Steel Trades 509
The Shoreditch New Goods Station 510
Exhibition of Gas Apparatus in Leeds 510
The Excavations at Olympia 510
Wood Paving at the New Law Courts 510
Yorkshire Fine Art and Industrial Exhibition 511
The Sydney International Exhibition Building 513
Concerning the Fabric of the Church and the Form thereof, from the Earliest Age to the End of the Eleventh Century 517
Electric Light Apparatus at the Albert Hall 520
The Church of St. Sepulchre, Snow-hill: London and Middlesex Archæological Society 522
Exhibition of Cutlery 523
The Hackney New Infirmary 524
Proposed Conversion of St. Katherine's Docks 524
Public Baths and Washhouses for the Parish of St. George the Martyr 524
The London Steamboat Company: Proposed Lease of the Property 524
Asphaltic v. York Paving in Fulham 524
The "Black and White" 524
Theatres and the Metropolitan Board of Works 524
Annual General Meeting of the Institute of British Architects 524
Employers' Liability for Injuries to Servants 525
Workmen and Hirers 525
Weymouth Drainage 525
Roofing Slates 525
Safety Ladders 525
Our Footpaths 525
Miscellanea 525

Architecture and General Art in Unity and Sympathy.

THE annual dinner of the Institute of British Architects had the fortune to precede that of the Royal Academy of Arts by a few days, and in consequence, it has been the occasion of the earliest public expression on the subject of the arts by Sir Frederick Leighton since his attainment of the presidentship which places him in the seat of Sir Joshua Reynolds. There was, it may be said, a certain moral fitness in this coincidence. If it can only, with daring inaccuracy, be said that architecture is the mother of the arts, it may at least claim to be the foster-mother, as it receives and gives appropriate place and shelter to the production of the other arts, while accepting in return very considerable enhancement to its own influence and attractions. If we look at the matter historically, and this it seems most natural to do when maternity and filiation are in question, we shall probably find that when several arts have contributed to individual distinction, it has been the painter or the sculptor who has been an architect also, and not the architect who has diverged with applause into the exercise of the arts of sculpture and painting. Giotto and Michelangelo were painters who made their mark in architectural design; and we read that the sculptor Phidias had leading control of the works on the Parthenon, not that the architect Ictinus interfered with the great sculptural compositions which gave the last glory to his work. It would be hasty, however, to propound any conclusion as to a positive law in this matter; we should have no right to be surprised if any day one who had already made himself a great name in architecture, were to come forward and surprise and delight us by equal mastery of graphic or plastic design. In like manner we may be disposed to consider, having regard to history and observation, that the more natural process of evolution is for a distinguished painter to wrest the wreath of sculpture from competitors only familiar with modelling tool and chisel, than for sculptors to suddenly make display of marked excellence as either draughtsmen or painters. Whatever may have been the special pride and predilection of Michelangelo himself, it is very difficult for one who is familiar with the Sistine ceiling not to regard him as a painter first and then a sculptor,—albeit that the sculptor of the "Moses" has a position which has to be estimated rather with reference to proximity to the ancients than the moderns; it would not be easy to point to contemporary sculptor-painters whom we could hold to range with three contemporary painters, at least, who have made more than considerable mark in sculpture. Observations of this nature have an important application that must cover and excuse any seeming invidiousness. If a student of sculpture is wise, he will draw from them the conclusion that considerable attention not merely to draughtsmanship, but to pictorial management of light and shade, and even to harmonies of colouring, will be of effective furtherance in his treatment of his proper materials, whether in the very lowest relief or the boldest combinations in the round. And the architect no less may take the conviction as warmly to heart that however he may aspire and resolve to be an architect in the first place and above all, he will be so with all the more perfection for having gained command and refinement of line, appreciation of complex unity, and power of anticipating the ultimate effect of a completed work when exposed to all "the skyey influences" of shadowed and reflected tints, by exercised study, pencil or brush in hand, of the human form and all the incidents and accidents of its customary surroundings.

Moreover, it is only by a certain degree of practical familiarity with allied arts that the professor of any one can be expected to regard them in his own work with due consideration and perfect sympathy. As the requirements of civilisation develope, the problems of architecture, as Sir Frederick Leighton truly observed, become more complex than they used to be. The proper housing of the arts themselves and works of art becomes an element in the function of the architect, as important as was ever the primitive demand for the privacy and shelter against the weather of the living occupants of his constructions. Not very remote, either in time or space, are apartments that were built for stately picture-galleries, in which the first essay in hanging pictures showed that the light was admitted at an angle which caused it to be so reflected from their surfaces as to render them invisible. What the fortune of sculpture has been in almost every building, even where its introduction was anticipated, it is painful to think; music has, perhaps, fared on the whole more favourably, if not uniformly so; but halls, of which the purpose was frustrated entirely if declamation and oratory were not audible throughout, have in many most important cases required such alteration as to imply that the requirements had either been left out of thought entirely, or that thought had only become bewildered in endeavouring to deal with it. What need, then, to speak of the distress inflicted on librarians who have entered after the labours of the architect have ceased, to find that all recesses have been so arranged that only by ruthlessly interfering with elaborate architectural features, can he lodge shelves of depth and capacity to accommodate a range of quartos? Why venture to repeat the expressions of curators whose impatience has been roused by difficulties unfairly imposed upon them in displaying mere scientific specimens?

Alas! then, what respect can it be expected that architecture will bestow upon the interests of other arts when it threatens to be forgetful of those which it is its own primary business to consult,—what mercy is to be expected for the ministry to the graces of our life, when the first conveniences are insufficiently consulted? Why, indeed, should we turn aside to criticise what comparatively is in the place of rhetorical ornament when fundamental logic is unsound?

So we may sometimes be tempted to exclaim when offended by a conspicuous failure, but let a wise word of Socrates recal us to saner consideration. "What should you say,"—is his inquiry of a depressed colloquitor,—"what should you say of a man who has put implicit trust in another, and then it may be in another also, and has found that his confidence has been betrayed, if he should in consequence renounce confidence in all mankind, and convince himself that it were futile to seek thereafter for any who were trustworthy? Should you not say that this was the part of a very narrow-minded person, and of one who knew nothing of the world, or of how to live in it? Why, then, give up the search after truth because one attempt has been baffled?" Quite as little disposed are we to admit that architecture cannot live in unity and sympathy with the other arts, unpleasant as their disagreements with her sometimes are. On the one hand, the complexity growing on the arts enforces subdivision; and, on the other, sympathy between the arts is essential to the perfection of any one.

The relations of sculpture and painting to architecture at present are as contrasted as their primary conditions. Sculpture is the most intimate and immediate ally. Its assistance is proffered and accepted in most pronounced form when statues are introduced in niches, or surmount sky-lines, or support entablatures as caryatides, or when friezes with definite subjects range along considerable extents. Then we have the groups that fill up spandrels on either side of window arches or portals, heads or figures upon keystones, or peeping from circlets. It is hard, indeed, if the architect is to have no voice in the designing and style of projection of these subjects; if his leading lines are to be at the mercy of practitioners who have no mercy upon the professor of another art, and are too forward to renounce allegiance to him and to all his works. Chantrey placed his statue of James Watt in a chapel of Westminster Abbey, with the most unchallengeable judgment as to its favourable reception of light; but it is out of square with all the architecture around, to say nothing of standing a manifestation of how utterly unconscious and unsympathetic the sculptor was with the leading associations of a sacred locality. The window was to him a window admitting light into an area that might be his own studio, or might be the sculpture tribune at the old National

Gallery—"poking hole,—sad poking hole,"—as it was described by his late majesty William IV. So it is that the interest of his effect must determine the architect to do his best to select the best sculptor, or to control the best that it is allowed to him to have as colleague or subordinate. But it is evident that what control he may exercise will only get him into further difficulties, unless he is qualified to appreciate sculpture in itself, and then in its architectonic application.

The remains which have been recovered from the temple of Ephesus exhibit an application of life-size sculpture in high relief at the lower drums of columns, that, as well or ill designed and executed, would make or mar the architectural effect still more decidedly than any such questionable attempts as seem to have occupied the Olympian pediments. The invention of the Corinthian capital, which has had such momentous influence on the subsequent development of architecture, was pretty certainly the invention of a sculptor. And what does not architecture owe to the exhaustless variations of beauty that it has evolved, through many a noble Composite type, and downward through Mediæval shaftlet and pier and colonnette, and in delicate works of the Renaissance, which in refinement and perfection of execution rival the works of the very sculptors who conferred the crowning graces upon the design of the Erechtheum?

Where foliage more or less conventional is concerned, it may be understood that the sculptor may stand apart from the architect, but still the architect must himself be the equivalent of a sculptor,—must have his most special qualifications as architect completed by a certain sculptural accomplishment and endowment in respect of another class of enrichment of his works,—that is, in respect of mouldings. Among the Greeks, as with the artists of the Renaissance, the elaboration and refinement of mouldings kept pace with the progress of sculpture. It was much the same with the Mediævals. So long as the fullest perfection of foliage did not attempt or accomplish much beyond a dogtooth or a ball-flower, there was a distressing poverty about the combinations of arch mouldings, which was superseded, *pari passu*, with the advance of general skill in ornamental carving. The design of an effective gradation of arch mouldings, indeed, makes demand upon the same appreciation of gradated shadows,—the deepened, the cast, and the reflected,—and on the contrasts of smooth and sharpened contours, that are the very alphabet of sculptural management. In Classic architecture of the highest class all profiles, interior and exterior, were studied and finished with as much care as could be bestowed upon a statue; to the diminution, the inclination, and the sloping of a column, a degree of study was devoted to which the setting up of a Gothic compound pier, for all its sectional complexity, was as simple a matter as the building of any boundary brick wall.

The architect must be,—the architect is,—a sculptor when mouldings are to be designed with appropriate force and delicacy and effect; and there is need for him to be so, not only when he aspires to be original in his profiles, but even when he is more humbly, modestly, or idly content to borrow from the precedents of which the world of architectural records has now accumulated such a store. Fine art is not to be borrowed and applied with any success by those who have not the intuitive apprehension and sympathy with fine art. If the matter be but so simple as the transfer,—"convey, the wise it call,"—of a hood-moulding or a mullion, whatever merit they possessed in their original seat may easily vanish on their way to an unworthy misapplication.

And there is an indispensable pictorial element, as well as a sculptural, in fully-developed architectural accomplishment. Of course, this finds its opportunity and exercise chiefly in the selection of materials that are agreeable in colour; and in dealing with those of less original value in this respect, in such manner as to make the best of them. This is an affair quite distinct from any indulgence in applied colour,—in applied paint; it has regard to the original tints of stone or of brickwork, to the agreeable combination of stone and brick, or brick of various colours,—of terra cotta of various tints, with contrasted brick or even stone, and of stone with stone, plain with polished, and so forth. Who that is endowed with any pictorial sense does not hastily withdraw his eyes from a structure where white brick or cream-coloured is seamed with lines of charcoal blackness, or sanguinary vermilion, that as introduced are in harshest discord, and suggestive of nothing else than that a stock of odd materials was to be disposed of somewhere and somehow? Polychrome architecture attempts a serious problem, which, if not justified by conspicuous success, is failure utter and irredeemable; and suggests a comparison not even with anything so comparatively dignified as a rainbow disarranged, but rather with a harlequin costume in tatters.

A word, which might be called a word of warning were it not too late, applies to the use which architecture is naturally tempted to make of the large masses and beautiful colour of polished granites. As these are frequently introduced for shafts of columns, it is impossible not to congratulate the art upon such an opportunity of enrichment. But the art should rise to the occasion. A sensitive eye is offended by the right-lined profile, and longs for the relief of an entasis that would have borne witness to reliance for effect having been cast, not entirely on the brute material, but to tasteful study having also asserted a right to participation. The bearing of this remark, however, is sculptural; more allied to pictorial conditions is the objection to the exhibition of masses of uniform colour, however beautiful in itself, that stands alone, that blends neither with the general material of the façade, nor is relieved by subordinate contrasting accompaniments. What the difficulty is may be pretty clear, and we need not make a mystery of it. The introduction of coloured and polished shafts commits the architect to a problem that is, in truth, of too serious a range and charge to be fully carried out; and yet the temptation to the adoption of the material is not to be resisted by him, and, indeed, it may be imposed upon him, whether willingly or not. The incongruity is glaring, but the difficulty no less so. For the bestowal of such splendour on the shafts to be justified, as much, at least, and even more, should be bestowed upon the sculptured capitals and moulded bases. Nothing less than gilding or material of metallic lustre and dignity would be appropriate for the capitals in such association, and the bases should at least be of some different and more sombre-coloured marble. But then there is the frieze; then there are the carved string-courses to be brought into harmony. Evidently the problem is too exacting for resources at command, or if it is not, at every advance towards complexity the peril of catastrophe threatens the timid as likely to be more serious, so the original incongruity is rested in. It is commended for that relative advantage, dear in all arts and studies to the mediocrity, "that either fears its fate too much or its deserts are small,"—it is safer. It is the same incongruity that offends when gilding is sparsely distributed about highly decorative iron railings, only to emphasise poverty by the plainness of other parts with equal claim to honour.

Some sensitiveness, then, to the harmonies and discordances of colour is all-important for the architect; but it may be that, in one respect, it were well to utter a caution against a liability to rely over-much on some effects which fairly enough commend themselves to the painter. So multifarious are the resources and accessories that enable a painter to modify a principal subject, that sometimes it appears to matter little, when open-air subjects are in question, what he may choose. It may be said with security that there are very few ugly things, and probably no ugly buildings, that a skilful painter cannot make picturesque. By cunning point of view, by dexterous light and shade, by artful atmospheric effect, and the glamour of incidental colour, he can impart a charm to interiors or to exteriors that no architectural student could contemplate as architectural objects with calm toleration. But it is the business of an architect to make his work architecturally beautiful and satisfactory in itself; to rely upon the incongruity which a painter might make much of, for a true architectural success, were as consistent as to look forward to an ultimate state of ruin which might satisfy the painter still better. We no more want our finished buildings to gain variety by awkwardness and inconsistency, than we desire to be familiar in ordinary life with the moral obliquities that give interest to the comedies of Sheridan or tragedies of Shakespeare. An interesting illustration in a recent *Builder*, furnishes a case in point. A Christian Acropolis,—Erfurt, Germany,—presents, in a scene of very considerable pictorial merit, an architectural group that is decidedly picturesque. The picturesqueness is not slightly assisted by the contrast of the Romanesque tower, which flanks an octagon Decorated lantern, and is interposed between a fifteenth-century nave and a fourteenth-century choir. But woe is the architect who should take what suits a painter so well as a model. A painter, again, may rejoice in the arched recesses round the substructions of the choir; an architect, aware of all contingencies which they imply, and conscious of all that they contradict, may turn from them with repugnance in their present state, though he may reserve his opinion as to how far the secret of the effect which they produce may not be due to a relation of masses not unreducible under stricter management to due architectural subordination.

THE ROYAL ACADEMY.

THE exhibition of 1879 will probably be chronicled in most quarters as a good one, containing a larger proportion of really good works than for two or three previous years, some of them by rising men who have not hitherto been prominently known. There is, however, the drawback (for it certainly is one to most people) that there is no "picture of the year," no pre-eminently successful or striking work which forms the central point of attraction: and the most brilliant names in the roll of Academicians cannot be said to be at their best. The new President has sent a number of works, all of them marked by his extraordinary finish of style and execution, but we can hardly say that any one of them is a work of the highest interest, such as could be named with "The Juggler," or "The Athlete." The large painting of "Elijah in the Wilderness" (188) is so exceedingly cold, mannered, and academical that one can only regard it as, what in point of fact it presumably is, a study on a great scale, rather than a work intended to convey any new conception in regard to the character it represents. The other works of the president are chiefly studies of female heads, or half-lengths under various names, "Biondina," "Catarina," &c.; these are all marked by a kind of lazy sensuous beauty, and all finished up to that almost waxen smoothness of surface in the flesh which we cannot but think is carrying finish a great deal too far for the real objects of painting. We are reminded by them of the remarks in Haydon's lectures on painting in regard to the face in nature; how the most beautiful woman's face would appear on a very close inspection to have a certain coarseness of texture, because "Nature allows something for distance," and if the face were of the finish of wax or ivory when closely viewed, it would be hard and deficient in tone at a greater distance. This seems to be exactly the defect of Sir Frederick Leighton's system of face-painting as now developed. The finish is so fine that it will bear looking at with the eyes close to the canvas,—indeed, it is hardly fully appreciated otherwise; but then the consequence is that at the usual distance for taking in the general impression of a painting, these heads look hard, waxy, and lifeless. We hope that next year something more equal in interest to the best things he has done will be seen from the hand of the President than any of his contributions of this year can fairly be said to be.

Mr. Poynter's large work, the "Nausicaa and her Maidens," will also, we fear, be felt by every one to be a painting which has failed in its aim. It is really, in fact, difficult to say what point of interest there is in it at all, and we can only conclude that the artist has been overworked with other responsibilities, and has been unable to give the best of his mind and labour to this large canvas. It seems a great pity that so large a work should have been undertaken at all, under any circumstances in which the painter could not make it worthy of his reputation, which it certainly is not. Mr. Millais, whose contributions are always among the first things that are thought of on going to a new exhibition, is more like himself than his two gifted brethren just mentioned. His portrait of Mr. Gladstone (214) is in his best style, and very fine in every way; the two portraits of ladies which he has sent are not equal to one that is in the Grosvenor Gallery, nor can we regard his landscape this year as of very high interest.

All this is disappointing, for those three names are among those we always look to as the towers of strength of the exhibition, and the impression which is nevertheless produced, that this is

really a good year, says much for the successful labours of some of those who have not yet attained to equal fame, as well as of the other eminent names in the Academy ranks. Among these latter Mr. Tadema is remarkably good this year, although his works are of a class which, in all probability, will not interest general visitors sufficiently to make them much talked about. If this artist had the faculty of strongly expressing human feeling or passion it can hardly be doubted that he would be *facile princeps* among the leading painters of the day, for as an executant he seems to us to be quite unequalled in this country, which (fortunately for us) he has made his own; but his paintings want the element of human interest and feeling, without which no painter can gain a hold upon the sympathies of the majority even of cultivated people. The largest work he has sent this year eminently illustrates his power and his weakness at once. It is called "Down to the River" (238), and is a curious experiment in perspective and composition. We are overlooking the Tiber in the days of imperial Rome, in the foreground a woman with children descends some steps, and is offered a boat by some men whose heads appear just below,—the wherrymen of the period,—who point to the river and recommend their boats; on the extreme right we look almost down upon the head of another lady, who has preceded her companion down the stairs, and the top of whose head alone is visible. What more than anything else makes the picture is, however, the splendid painting of the bridge crossing the river, with its niches with bronze statues between the arches, its triumphal arch at the further end, and the white front of a temple glittering in the sun still further in the distance. The yellow calm water, reflecting the bridge, is also beautifully painted; as a realisation of one corner of the Roman architecture of the part it is really wonderful. A small painting, called "Pomona Festival," is exceedingly amusing (351), it represents a family ritual, where a dance is being executed in a ring round a tree, on which offerings are hung, to the accompaniment of flutes played by two attendants; one of the dancers, a big man with his back to us, has sprung 3 feet from the ground in the ardour of his worship of the goddess of good things, and is evidently about to come down with a whack on the flat of both feet. There is something "human" in this, after all, and it is interesting to think that we possibly see here something very like the way in which such rites, which sound very poetical in history, were really performed. Mr. Tadema's other work, "A Hearty Welcome," contains beautiful painting of a Roman garden scene, but here, again, we feel that the expression of the welcome is merely subordinate; the picture is painted only to show the treatment of the scene, and the figures serve to give a name to it.

It is a new point of interest in visiting the Academy now to notice what has been bought with the funds provided by the Chantrey bequest, and hitherto the trust has been administered with great judgment in the main, and the Academy have carried out what we presume to have been one of the main intentions of the bequest in making it an opportunity for conferring distinction and encouragement, as well as more solid reward, upon rising artists who seem likely to do honour to the English school. This end seems to have been specially kept in mind in the selection made from this year's exhibition. The pictures purchased are "The Waning of the Year" (21), by Mr. Ernest Parton; "Their only Harvest" (435), by Mr. Colin Hunter; "The Swineherd" (532), from "Ivanhoe," by Mr. C. E. Johnson; "Toil and Pleasure" (540), by Mr. John E. Reid; and "An Old Mill" (692), by Mr. Thomas Wade. Mr. Hunter's work is a great advance upon the excellent promise made by him in last year's Academy exhibition; it is a large painting representing a group of toilers of the sea laboriously fishing up seaweed into a small boat which occupies the centre of the work, the main object of which is the representation of the sea, which is remarkably successful in regard to motion, tone, and transparency, without suggesting the manner of any other sea-painter of the day, though the feeling of the work perhaps may be said to grow out of that which is characteristic of Mr. Hook's paintings, more especially in regard to the figures. The load of seaweed already piled in the boat gives opportunities for a very rich combination of colour which is an important element in the effect of the whole, and in contrasting with the cold gleam of the water. Mr. Ernest Parton's name we first took note of as attached to a small but very able and original little landscape which was hung unobtrusively in one corner of Gallery I. last year. He now occupies a central place in the same room, with a landscape which is more fitted to attract general attention, and quite worthy of its place, though the last year's smaller work was quite up to it in real merit, and perhaps almost before it in originality. Mr. Johnson's work is a large landscape in a broad Poussinesque style, with Gurth and his herd of swine in the foreground, the animals being admirably studied, though the predominant interest is in the landscape. "Toil and Pleasure" is in some respects a more strikingly clever and yet a less satisfactory work than the others. It represents a group of field labourers, men and women pausing from their work in a turnip-field to watch the members of the hunt getting over or through the hedge of the field, not in a very brilliant manner, as none seemed to have fairly leaped it, but to be dragging their horses through anyhow: the group of rustics are admirably and thoroughly studied, each has his or her own way of looking at the matter and their individual characters are discriminated so carefully and with so much point and humour as to give a remarkably lifelike reality to the group; part of the humour of the painting consists in the inference conveyed in the title, for on the whole one is induced to suppose that the toil lies with the huntsmen and the pleasure with those who are enjoying their discomfiture. The less satisfactory element in the work is the colour and treatment of the landscape, the field which forms the scene of action especially, in which the vegetation is pervaded by a bright unpleasant green, and each separate turnip is painted with an obtrusive minuteness which gives a spotty and garish effect to the whole, and tends to distract the eye from the figures. More reticence in detail would have given a more satisfactory effort to what is nevertheless a brilliant and able painting. Mr. Wade's drawing is among the water-colours, and may be noticed when we come to speak of them; they are of more consequence than usual this year.

We may now take some of the principal works in the galleries consecutively. Mrs. Butler (Miss Elizabeth Thompson) appears in Gallery I. with a work entitled "'Listed for the Connaught Rangers" (20), a tract of Irish bog country, over which come the recruiting sergeant and one or two privates accompanied by the two recruits, whose manner of looking at the matter is well contrasted; one marches defiantly forward with his pipe in mouth and a swaggering air, the other turns back to take a last look at a cottage seen in the distance; the work tells its story completely, and is interesting as being a step out of the range of work by which the artist has hitherto been known, though still closely connected with the military interest. A painting of soldiers' life in full operation effectively balances this, Mr. Seymour Lucas's "Gordon Riots" (25), where a company of infantry are drawn up in the street and the front rank are firing upon a shouting mob whose physique, as far as the figures are made out at all, is too decidedly Irish in character for the locality of the incident represented. We can hardly say the painting interests us very much, though there is admirable work in it; with the exception of the irate figure of the mounted officer, there is a want of real energy and action about it. "A Water-Frolic" (32), by Mr. Hamilton Macallum, a coast scene with boys bathing, is worth note, though it embodies an effect of sunlight on a nearly smooth sea which he has given us rather often. Mr. Calderon's "Summer Breezes" is a very successful and pretty work, as far as the figure is concerned, which is the three-quarter length of a lassie who is nearly blown along the shore by a stiff breeze against which she leans backward as she walks; the action of the figure and the rather embarrassed expression of the face are very real, the sea cannot be said to be so: *non omnes omnia*, sea is not Mr. Calderon's specialty. The work of the highest aim in this gallery is Mr. Fildes's "Return of a Penitent" (63), in which, however, we can hardly feel as much interest as the painter would have us. A girl who has wandered from home and from virtue has returned to her native village, and crouches on the doorstep of her home, either afraid or forbidden to enter. The real point of the picture consists in the various expressions and gestures with which her case is commented upon by the village *quidnuncs* in the street; some of the figures are very characteristic in expression, especially the women (whose comments, we may naturally expect, would be the most forcible), but we can hardly say that the picture tells its tale very thoroughly. Mr. H. Moore's "By Stress of Weather driven" (75), is a grand confused representation of a harbour all in foam and commotion from a landward gale; craft knocking about in every direction, and all things in stormy movement. Among smaller things in the room, M. E. Frère's "Grandmama et sa petite Fille" (40), is one of the most charming specimens of his art that we have seen for some time; and Mr. Marks's "Intellect and Instinct" (73), is an excellent bit of humour, not excluding other and more specially artistic qualities.

In Gallery II. we are brought to a halt by a landscape of Mr. A. W. Hunt's, "Leafy June," illustrated by two lines from Andrew Marvell's poem, "The Garden,"—

> "Annihilating all that's made
> To a green thought in a green shade."

The scene is not, however, a garden, but a woodland nook, with a high bank or rock covered with trees, whose colours are reflected in a pond occupying great part of the foreground. The painting is a perfect glitter of bright foliage tones and catching lights, painted with that uncompromising force and vividness in which Mr. Hunt has no rival except, perhaps, Mr. Brett, whose method, however, is so different that no comparison is possible. Mr. Hunt's painting is one of his most successful efforts of the kind, a work quite distinct from what any other living landscape-painter either could or would produce, and one is glad to notice that those concerned in the hanging have at last thought proper, in their wisdom, to give this powerful and original artist such a place as he has a claim to—a claim long pertinaciously ignored at Burlington House. Mr. F. Morgan, one of the younger artists, upon whom to some extent the mantle of F. Walker may be said to have fallen, shows a steady advance in his country landscape with figures, under the title "Midday Rest" (111). Mr. Moore's sea-piece, "Calming Down," may be taken as the companion or sequel to his above-mentioned work in the first room, and Mr. H. W. B. Davis exhibits, in his "Cutting Forage on the French Coast," the usual qualities which we have become accustomed to connect with his landscape and cattle paintings, qualities of an eminently satisfactory and sensible description, though hardly those which characterise what can be called genius. A small work by Mr. Andrew C. Gow, next to this, "A Musical Story by Chopin" (134), has real individuality of subject and treatment; it represents an incident in the childhood of Chopin, when he is said to have astonished his school-fellows and tutors by his *extempore* effusions at the piano: the incident is completely told; the child, perched on the top of a very high stool, plays with an earnest expression of concentration; the most noteworthy of the other figures is that of the master, who, seated in the background and reading, is drawn away from his studies by his surprise, admirably depicted in his countenance, at the performance of his young pupil. Before quitting Gallery II. we may return to notice a coast scene by Mr. W. J. Richards, "Trebarwith Strand, Cornwall" (103), remarkable for the fine painting of the sea in the middle distance. Further remarks we must defer.

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Gallery—"poking hole,—sad poking hole,"—as it was described by his late majesty William IV. So it is that the interest of his effect must determine the architect to do his best to select the best sculptor, or to control the best that it is allowed to him to have as colleague or subordinate. But it is evident that what control he may exercise will only get him into further difficulties, unless he is qualified to appreciate sculpture in itself, and then in its architectonic application.

The remains which have been recovered from the temple of Ephesus exhibit an application of life-size sculpture in high relief at the lower drums of columns, that, as well or ill designed and executed, would make or mar the architectural effect still more decidedly than any such questionable attempts as seem to have occupied the Olympian pediments. The invention of the Corinthian capital, which has had such momentous influence on the subsequent development of architecture, was pretty certainly the invention of a sculptor. And what does not architecture owe to the exhaustless variations of beauty that it has evolved, through many a noble Composite type, and downward through Mediæval shaftlet and pier and colonnette, and in delicate works of the Renaissance, which in refinement and perfection of execution rival the works of the very sculptors who conferred the crowning graces upon the design of the Erechtheum?

Where foliage more or less conventional is concerned, it may be understood that the sculptor may stand apart from the architect, but still the architect must himself be the equivalent of a sculptor,—must have his most special qualifications as architect completed by a certain sculptural accomplishment and endowment in respect of another class of enrichment of his works,—that is, in respect of mouldings. Among the Greeks, as with the artists of the Renaissance, the elaboration and refinement of mouldings kept pace with the progress of sculpture. It was much the same with the Mediævals. So long as the fullest perfection of foliage did not attempt or accomplish much beyond a dogtooth or a ball-flower, there was a distressing poverty about the combinations of arch mouldings, which was superseded, *pari passu*, with the advance of general skill in ornamental carving. The design of an effective gradation of arch mouldings, indeed, makes demand upon the same appreciation of gradated shadows,—the deepened, the cast, and the reflected,—and on the contrasts of smooth and sharpened contours, that are the very alphabet of sculptural management. In Classic architecture of the highest class all profiles, interior and exterior, were studied and finished with as much care as could be bestowed upon a statue; to the diminution, the inclination, and the sloping of a column, a degree of study was devoted to which the setting up of a Gothic compound pier, for all its sectional complexity, was as simple a matter as the building of any boundary brick wall.

The architect must be,—the architect is,—a sculptor when mouldings are to be designed with appropriate force and delicacy and effect; and there is need for him to be so, not only when he aspires to be original in his profiles, but even when he is more humbly, modestly, or idly content to borrow from the precedents of which the world of architectural records has now accumulated such a store. Fine art is not to be borrowed and applied with any success by those who have not the intuitive apprehension and sympathy with fine art. If the matter be but so simple as the transfer,—"convey, the wise it call,"—of a hood-moulding or a mullion, whatever merit they possessed in their original seat may easily vanish on their way to an unworthy misapplication.

And there is an indispensable pictorial element, as well as a sculptural, in fully-developed architectural accomplishment. Of course, this finds its opportunity and exercise chiefly in the selection of materials that are agreeable in colour; and in dealing with those of less original value in this respect, in such manner as to make the best of them. This is an affair quite distinct from any indulgence in applied colour,—in applied paint; it has regard to the original tints of stone or of brickwork, to the agreeable combination of stone and brick, or brick of various colours,—of terra cotta of various tints, with contrasted brick or even stone, and of stone with stone, plain with polished, and so forth. Who that is endowed with any pictorial sense does not hastily withdraw his eyes from a structure where white brick or cream-coloured is seamed with lines of charcoal blackness, or sanguinary vermilion, that as introduced are in harshest discord, and suggestive of nothing else than that a stock of odd materials was to be disposed of somewhere and somehow? Polychrome architecture attempts a serious problem, which, if not justified by conspicuous success, is failure utter and irredeemable; and suggests a comparison not even with anything so comparatively dignified as a rainbow disarranged, but rather with a harlequin costume in tatters.

A word, which might be called a word of warning were it not too late, applies to the use which architecture is naturally tempted to make of the large masses and beautiful colour of polished granites. As these are frequently introduced for shafts of columns, it is impossible not to congratulate the art upon such an opportunity of enrichment. But the art should rise to the occasion. A sensitive eye is offended by the right-lined profile, and longs for the relief of an entasis that would have borne witness to reliance for effect having been cast, not entirely on the brute material, but to tasteful study having also asserted a right to participation. The bearing of this remark, however, is sculptural; more allied to pictorial conditions is the objection to the exhibition of masses of uniform colour, however beautiful in itself, that stands alone, that blends neither with the general material of the façade, nor is relieved by subordinate contrasting accompaniments. What the difficulty is may be pretty clear, and we need not make a mystery of it. The introduction of coloured and polished shafts commits the architect to a problem that is, in truth, of too serious a range and charge to be fully carried out; and yet the temptation to the adoption of the material is not to be resisted by him, and, indeed, it may be imposed upon him, whether willingly or not. The incongruity is glaring, but the difficulty no less so. For the bestowal of such splendour on the shafts to be justified, as much, at least, and even more, should be bestowed upon the sculptured capitals and moulded bases. Nothing less than gilding or material of metallic lustre and dignity would be appropriate for the capitals in such association, and the bases should at least be of some different and more sombre-coloured marble. But then there is the frieze; then there are the carved string-courses to be brought into harmony. Evidently the problem is too exacting for resources at command, or if it is not, at every advance towards complexity the peril of catastrophe threatens the timid as likely to be more serious, so the original incongruity is rested in. It is commended for that relative advantage, dear in all arts and studies to the mediocrity, "that either fears its fate too much or its deserts are small,"—it is safer. It is the same incongruity that offends when gilding is sparsely distributed about highly decorative iron railings, only to emphasise poverty by the plainness of other parts with equal claim to honour.

Some sensitiveness, then, to the harmonies and discordances of colour is all-important for the architect; but it may be that, in one respect, it were well to utter a caution against a liability to rely over-much on some effects which fairly enough commend themselves to the painter. So multifarious are the resources and accessories that enable a painter to modify a principal subject, that sometimes it appears to matter little, when open-air subjects are in question, what he may choose. It may be said with security that there are very few ugly things, and probably no ugly buildings, that a skilful painter cannot make picturesque. By cunning point of view, by dexterous light and shade, by artful atmospheric effect, and the glamour of incidental colour, he can impart a charm to interiors or to exteriors that no architectural student could contemplate as architectural objects with calm toleration. But it is the business of an architect to make his work architecturally beautiful and satisfactory in itself; to rely upon the incongruity which a painter might make much of, for a true architectural success, were as consistent as to look forward to an ultimate state of ruin which might satisfy the painter still better. We no more want our finished buildings to gain variety by awkwardness and inconsistency, than we desire to be familiar in ordinary life with the moral obliquities that give interest to the comedies of Sheridan or tragedies of Shakspeare. An interesting illustration in a recent *Builder*, furnishes a case in point. A Christian Acropolis,—Erfurt, Germany,—presents, in a scene of very considerable pictorial merit, an architectural group that is decidedly picturesque. The picturesqueness is not slightly assisted by the contrast of the Romanesque tower, which flanks an octagon Decorated lantern, and is interposed between a fifteenth-century nave and a fourteenth-century choir. But woe is the architect who should take what suits a painter so well as a model. A painter, again, may rejoice in the arched recesses round the substructions of the choir; an architect, aware of all contingencies which they imply, and conscious of all that they contradict, may turn from them with repugnance in their present state, though he may reserve his opinion as to how far the secret of the effect which they produce may not be due to a relation of masses not unreducible under stricter management to due architectural subordination.

THE ROYAL ACADEMY.

THE exhibition of 1879 will probably be chronicled in most quarters as a good one, containing a larger proportion of really good works than for two or three previous years, some of them by rising men who have not hitherto been prominently known. There is, however, the drawback (for it certainly is one to most people) that there is no "picture of the year," no pre-eminently successful or striking work which forms the central point of attraction: and the most brilliant names in the roll of Academicians cannot be said to be at their best. The new President has sent a number of works, all of them marked by his extraordinary finish of style and execution, but we can hardly say that any one of them is a work of the highest interest, such as could be named with "The Juggler," or "The Athlete." The large painting of "Elijah in the Wilderness" (188) is so exceedingly cold, mannered, and academical that one can only regard it as, what in point of fact it presumably is, a study on a great scale, rather than a work intended to convey any new conception in regard to the character it represents. The other works of the president are chiefly studies of female heads, or half-lengths under various names, "Biondina," "Catarina," &c.; these are all marked by a kind of lazy sensuous beauty, and all finished up to that almost waxen smoothness of surface in the flesh which we cannot but think is carrying finish a great deal too far for the real objects of painting. We are reminded by them of the remarks in Haydon's lectures on painting in regard to the face in nature; how the most beautiful woman's face would appear on a very close inspection to have a certain coarseness of texture, because "Nature allows something for distance," and if the face were of the finish of wax or ivory when closely viewed, it would be hard and deficient in tone at a greater distance. This seems to be exactly the defect of Sir Frederick Leighton's system of face-painting as now developed. The finish is so fine that it will bear looking at with the eyes close to the canvas,—indeed, it is hardly fully appreciated otherwise; but then the consequence is that at the usual distance for taking in the general impression of a painting, these heads look hard, waxy, and lifeless. We hope that next year something more equal in interest to the best things he has done will be seen from the hand of the President than any of his contributions of this year can fairly be said to be.

Mr. Poynter's large work, the "Nausicaa and her Maidens," will also, we fear, be felt by every one to be a painting which has failed in its aim. It is really, in fact, difficult to say what point of interest there is in it at all, and we can only conclude that the artist has been overworked with other responsibilities, and has been unable to give the best of his mind and labour to this large canvas. It seems a great pity that so large a work should have been undertaken at all, under any circumstances in which the painter could not make it worthy of his reputation, which it certainly is not. Mr. Millais, whose contributions are always among the first things that are thought of on going to a new exhibition, is more like himself than his two gifted brethren just mentioned. His portrait of Mr. Gladstone (214) is in his best style, and very fine in every way; the two portraits of ladies which he has sent are not equal to one that is in the Grosvenor Gallery, nor can we regard his landscape this year as of very high interest.

All this is disappointing, for those three names are among those we always look to as the towers of strength of the exhibition, and the impression which is nevertheless produced, that this is

really a good year, says much for the successful labours of some of those who have not yet attained to equal fame, as well as of the other eminent names in the Academy ranks. Among these latter Mr. Tadema is remarkably good this year, although his works are of a class which, in all probability, will not interest general visitors sufficiently to make them much talked about. If this artist had the faculty of strongly expressing human feeling or passion it can hardly be doubted that he would be *facile princeps* among the leading painters of the day, for as an executant he seems to us to be quite unequalled in this country, which (fortunately for us) he has made his own; but his paintings want the element of human interest and feeling, without which no painter can gain a hold upon the sympathies of the majority even of cultivated people. The largest work he has sent this year eminently illustrates his power and his weakness at once. It is called "Down to the River" (238), and is a curious experiment in perspective and composition. We are overlooking the Tiber in the days of imperial Rome, in the foreground a woman with children descends some steps, and is offered a boat by some men whose heads appear just below,—the wherrymen of the period,—who point to the river and recommend their boats; on the extreme right we look almost down upon the head of another lady, who has preceded her companion down the stairs, and the top of whose head alone is visible. What more than anything else makes the picture is, however, the splendid painting of the bridge crossing the river, with its niches with bronze statues between the arches, its triumphal arch at the further end, and the white front of a temple glittering in the sun still further in the distance. The yellow calm water, reflecting the bridge, is also beautifully painted; as a realisation of one corner of the Roman architecture of the part it is really wonderful. A small painting, called "Pomona Festival," is exceedingly amusing (351), it represents a family ritual, where a dance is being executed in a ring round a tree, on which offerings are hung, to the accompaniment of flutes played by two attendants; one of the dancers, a big man with his back to us, has sprung 3 feet from the ground in the ardour of his worship of the goddess of good things, and is evidently about to come down with a whack on the flat of both feet. There is something "human" in this, after all, and it is interesting to think that we possibly see here something very like the way in which such rites, which sound very poetical in history, were really performed. Mr. Tadema's other work, "A Hearty Welcome," contains beautiful painting of a Roman garden scene, but here, again, we feel that the expression of the welcome is merely subordinate; the picture is painted only to show the treatment of the scene, and the figures serve to give a name to it.

It is a new point of interest in visiting the Academy now to notice what has been bought with the funds provided by the Chantrey bequest, and hitherto the trust has been administered with great judgment in the main, and the Academy have carried out what we presume to have been one of the main intentions of the bequest in making it an opportunity for conferring distinction and encouragement, as well as more solid reward, upon rising artists who seem likely to do honour to the English school. This end seems to have been specially kept in mind in the selection made from this year's exhibition. The pictures purchased are "The Waning of the Year" (21), by Mr. Ernest Parton; "Their only Harvest" (435), by Mr. Colin Hunter; "The Swineherd" (532), from "Ivanhoe," by Mr. C. E. Johnson; "Toil and Pleasure" (540), by Mr. John E. Reid; and "An Old Mill" (692), by Mr. Thomas Wade. Mr. Hunter's work is a great advance upon the excellent promise made by him in last year's Academy exhibition; it is a large painting representing a group of toilers of the sea laboriously fishing up seaweed into a small boat which occupies the centre of the work, the main object of which is the representation of the sea, which is remarkably successful in regard to motion, tone, and transparency, without suggesting the manner of any other sea-painter of the day, though the feeling of the work perhaps may be said to grow out of that which is characteristic of Mr. Hook's paintings, more especially in regard to the figures. The load of seaweed already piled in the boat gives opportunities for a very rich combination of colour which is an important element in the effect of the whole, and in contrasting with the cold gleam of the water. Mr. Ernest Parton's name we first took note of as attached to a small but very able and original little landscape which was hung unobtrusively in one corner of Gallery I. last year. He now occupies a central place in the same room, with a landscape which is more fitted to attract general attention, and quite worthy of its place, though the last year's smaller work was quite up to it in real merit, and perhaps almost before it in originality. Mr. Johnson's work is a large landscape in a broad Poussinesque style, with Gurth and his herd of swine in the foreground, the animals being admirably studied, though the predominant interest is in the landscape. "Toil and Pleasure" is in some respects a more strikingly clever and yet a less satisfactory work than the others. It represents a group of field labourers, men and women pausing from their work in a turnip-field to watch the members of the hunt getting over or through the hedge of the field, not in a very brilliant manner, as none seemed to have fairly leaped it, but to be dragging their horses through anyhow: the group of rustics are admirably and thoroughly studied, each has his or her own way of looking at the matter and their individual characters are discriminated so carefully and with so much point and humour as to give a remarkably lifelike reality to the group; part of the humour of the painting consists in the inference conveyed in the title, for on the whole one is induced to suppose that the toil lies with the huntsmen and the pleasure with those who are enjoying their discomfiture. The less satisfactory element in the work is the colour and treatment of the landscape, the field which forms the scene of action especially, in which the vegetation is pervaded by a bright unpleasant green, and each separate turnip is painted with an obtrusive minuteness which gives a spotty and garish effect to the whole, and tends to distract the eye from the figures. More reticence in detail would have given a more satisfactory effort to what is nevertheless a brilliant and able painting. Mr. Wade's drawing is among the water-colours, and may be noticed when we come to speak of them; they are of more consequence than usual this year.

We may now take some of the principal works in the galleries consecutively. Mrs. Butler (Miss Elizabeth Thompson) appears in Gallery I. with a work entitled "'Listed for the Connaught Rangers" (20), a tract of Irish bog country, over which come the recruiting sergeant and one or two privates accompanied by the two recruits, whose manner of looking at the matter is well contrasted; one marches defiantly forward with his pipe in mouth and a swaggering air, the other turns back to take a last look at a cottage seen in the distance; the work tells its story completely, and is interesting as being a step out of the range of work by which the artist has hitherto been known, though still closely connected with the military interest. A painting of soldiers' life in full operation effectively balances this, Mr. Seymour Lucas's "Gordon Riots" (25), where a company of infantry are drawn up in the street and the front rank are firing upon a shouting mob whose physique, as far as the figures are made out at all, is too decidedly Irish in character for the locality of the incident represented. We can hardly say the painting interests us very much, though there is admirable work in it; with the exception of the irate figure of the mounted officer, there is a want of real energy and action about it. "A Water-Frolic" (32), by Mr. Hamilton Macallum, a coast scene with boys bathing, is worth note, though it embodies an effect of sunlight on a nearly smooth sea which he has given us rather often. Mr. Calderon's "Summer Breezes" is a very successful and pretty work, as far as the figure is concerned, which is the three-quarter length of a lassie who is nearly blown along the shore by a stiff breeze against which she leans backward as she walks; the action of the figure and the rather embarrassed expression of the face are very real, the sea cannot be said to be so: *non omnes omnia*, sea is not Mr. Calderon's specialty. The work of the highest aim in this gallery is Mr. Fildes's "Return of a Penitent" (63), in which, however, we can hardly feel as much interest as the painter would have us. A girl who has wandered from home and from virtue has returned to her native village, and crouches on the doorstep of her home, either afraid or forbidden to enter. The real point of the picture consists in the various expressions and gestures with which her case is commented upon by the village *quidnuncs* in the street; some of the figures are very characteristic in expression, especially the women (whose comments, we may naturally expect, would be the most forcible), but we can hardly say that the picture tells its tale very thoroughly. Mr. H. Moore's "By Stress of Weather driven" (75), is a grand confused representation of a harbour all in foam and commotion from a landward gale; craft knocking about in every direction, and all things in stormy movement. Among smaller things in the room, M. E. Frère's "Grandmama et sa petite Fille" (40), is one of the most charming specimens of his art that we have seen for some time; and Mr. Marks's "Intellect and Instinct" (73), is an excellent bit of humour, not excluding other and more specially artistic qualities.

In Gallery II. we are brought to a halt by a landscape of Mr. A. W. Hunt's, "Leafy June," illustrated by two lines from Andrew Marvell's poem, "The Garden,"—

> "Annihilating all that's made
> To a green thought in a green shade."

The scene is not, however, a garden, but a woodland nook, with a high bank or rock covered with trees, whose colours are reflected in a pond occupying great part of the foreground. The painting is a perfect glitter of bright foliage tones and catching lights, painted with that uncompromising force and vividness in which Mr. Hunt has no rival except, perhaps, Mr. Brett, whose method, however, is so different that no comparison is possible. Mr. Hunt's painting is one of his most successful efforts of the kind, a work quite distinct from what any other living landscape-painter either could or would produce, and one is glad to notice that those concerned in the hanging have at last thought proper, in their wisdom, to give this powerful and original artist such a place as he has a claim to—a claim long pertinaciously ignored at Burlington House. Mr. F. Morgan, one of the younger artists, upon whom to some extent the mantle of F. Walker may be said to have fallen, shows a steady advance in his country landscape with figures, under the title "Midday Rest" (111). Mr. Moore's sea-piece, "Calming Down," may be taken as the companion or sequel to his above-mentioned work in the first room, and Mr. H. W. B. Davis exhibits, in his "Cutting Forage on the French Coast," the usual qualities which we have become accustomed to connect with his landscape and cattle paintings, qualities of an eminently satisfactory and sensible description, though hardly those which characterise what can be called genius. A small work by Mr. Andrew C. Gow, next to this, "A Musical Story by Chopin" (134), has real individuality of subject and treatment; it represents an incident in the childhood of Chopin, when he is said to have astonished his school-fellows and tutors by his *extempore* effusions at the piano: the incident is completely told; the child, perched on the top of a very high stool, plays with an earnest expression of concentration; the most noteworthy of the other figures is that of the master, who, seated in the background and reading, is drawn away from his studies by his surprise, admirably depicted in his countenance, at the performance of his young pupil. Before quitting Gallery II. we may return to notice a coast scene by Mr. W. J. Richards, "Trebarwith Strand, Cornwall" (103), remarkable for the fine painting of the sea in the middle distance. Further remarks we must defer.

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ARCHITECTURE AT THE ROYAL ACADEMY.

THE collection of designs in Gallery IX. contains the usual amount of good drawing, but as far as we can see, even less than the usual amount of originality or suggestiveness in regard to modern architectural treatment, and shows a more complete ignoring of plan than we remember for some time. In fact, the exhibition, as a whole, is thoroughly disheartening to all those who demand anything of architecture beyond pretty pictures and reproductions of the detail and the sentiment of the styles of the past. Just here and there are to be found some bits of original and forcible treatment struggling through the trammels of antiquarianism, but even these are few and far between. Most of the drawings one can only speak of at all by adopting their designer's standpoint, and regarding them solely as more or less successful imitations exhibited in more or less highly-finished or effective drawings.

We find hardly any prominent characteristics in regard to aim or achievement to draw us in the first instance towards any special works as predominant in importance, and therefore make what comments suggest themselves in the order of numbering; not, however, necessarily implying that we are exhausting our comments in the present article. Mr. J. J. Stevenson's "Ken Hill, Norfolk" (1,069), is an admirably coloured perspective of a red-brick house, carrying out with marvellous conscientiousness and precision the manner of the eighteenth-century English house, the characteristic incongruity of the period being reproduced even in such practical details as the camber arch with a semicircular hood-mould over it, the expression thus contradicting the construction in the most prominent manner possible. Mr. A. W. Blomfield's "Denton Hall, Grantham" (1,071), is practically a not unpleasing protest against this now fashionable style. It is a perspective with a high sight-line (not quite "a bird's-eye view") of a large and very picturesquely-grouped mansion in Late Gothic style, and though, of course, also imitative, has the merit of reproducing a manner which is perfectly harmonious and consistent with itself in all its details, and may be taken as an example of the fact that Gothic, even for domestic purposes, is not quite worked out yet, and is, at all events, capable of far more suitable and truly architectural expression for such a purpose than the mongrel manner of building which claims to supersede it. It is only a pity that the architect introduced battlements to some parts of the building,—a feature so entirely destitute of meaning in a modern house. Next to these is a powerful and rich-toned water-colour drawing of the "Interior of Henry VII.'s Chapel" (1,070) by Mr. Suggate; the detail of the fan-tracery is not quite sufficiently made out, but otherwise it is a very good piece of architectural illustration. The next thing that gives us pause is Mr. E. F. C. Clarke's "Church of St. Mary, Woolwich" (1,082), a design for the new arcade and new belfry, &c. The arcade might be described as Classic Romanesque in type; not quite Classic, but retaining Classic refinement of detail, with "composite" capitals; the columns are mounted on very high octagonal bases, which have a kind of reference to the line of the gallery soffit, up to which, or a little beyond which, they rise; but we should have thought a more direct relation with the design of the gallery might have been realised with better effect. Mr. Eldon Deane's "Design for a Convalescent Hospital on the Sea Coast" (1,088) is a highly picturesque drawing of a building forming three sides of a quadrangle, with big boulders making a foreground on the fourth side; it is Gothic of a somewhat irregular type, and as the special locality is not mentioned, we may presume it is rather a study of effect than a building designed for execution,—a consideration which may excuse the absence of a plan, although without one it is, of course, impossible to say whether the author has any idea as to hospital building or not. There is nothing in the design whatever to specialise it as a hospital. Mr. Waterhouse's "Interior of New Court, Carey-street, Lincoln's Inn" (1,094), seems very successfully considered in relation to the locality; the red brick and terra-cotta buildings are rather Gothic than Classic in detail, though not absolutely so, but the general effect is marked by a horizontality which is suitable to the purpose of the building and to the older buildings of the same type in its neighbourhood; the obliquely placed entrances at the angles are a pleasing feature.* The selected design for the Brompton oratory church, as also Mr. G. G. Scott's competition design for the same (1,099, 1,100), were both noticed in our columns at the time of the competition. Mr. Waterhouse's "New Offices of the Prudential Assurance Company" (1,101) represents that large red building of decidedly Gothic type which has attracted a good deal of attention recently on the north side of Holborn, and was illustrated in our pages not long ago; the drawing hardly indicates adequately the large scale of the building, which is a powerful and effective contribution to our street architecture. Mr. Street's "North-East View of Holmbury St. Mary Church" (1,107) is a pen perspective of a small church in Decorated Gothic style, marked by that solidity and appearance of mass which this architect has a peculiar faculty of imparting to small churches. "Lancing College Chapel" (1,108), by Messrs. R. H. Carpenter and B. Ingelow, is shown in two delicate little water-colour perspectives, representing what appears to be the interior of an early thirteenth-century crypt. Mr. J. O. Scott shows some original treatment in his "Tower of St. Paul's Church, Manchester" (1,112), with a saddle-back roof and a spirelet rising from the centre of the ridge. Mr. Emerson's "Takhtsingji Hospital, Bhoonagar, India" (1,113), is a very good drawing of a building reproducing Indian bracket architecture. If, again, the author had only given a plan, it would have been interesting to see how this style lent itself to hospital building; as it is, we see only a picture of Hindu architecture.

The design for the "Divinity and Literary Schools for the University of Cambridge" (1,117), by Mr. Basil Champneys, is one of the best drawings, and also one of the best pieces of Gothic in the room, and shows a building very well suited in external appearance to its object; the style is a reproduction of late Gothic, but not without original points. Mr. Wyatt's "New Hospital for Consumption at Brompton" (1,120) also looks like a hospital; but in both these cases a plan would have made all the difference in regard to our interest in the drawings. Mr. Chas. Rew's view of the "Market Hall, Mechlin" (1,121), is a large pen-drawing of that peculiarly picturesque structure, very well treated as far as the building is concerned: it is a pity the drawing was not made a little more complete, from an artistic point of view, by a more effective and less mechanical treatment of the foreground. In No. 1,125, we have another hospital design, "North London Consumption Hospital," which it appears to have taken three architects to produce, Messrs. F. W. Tasker, Battersbury, and Huxley: no plan again; the architectural physiognomy, Elizabethan, tending towards Jacobeanism, is pleasing. Mr. Jackson's new interior of Lampeter College Chapel (1,126) is a coloured drawing of a decorative scheme, conceived in good taste and with some originality; it includes the design for the roof, organ-case, and new stalls and canopies: the latter are kept, for the most part, in a rather subdued neutral tint, on which some judiciously-applied gilding comes out with good effect; it may be a question, however, whether the decided colour on the panelled ceiling, contrasted with this subdued tone in the lower part of the design, does not break up the scheme too much. We next notice a charming piece of decorative design by Mr. G. Aitchison, in his best manner,—"Staircase at No. 1, Grosvenor-crescent" (1,128),—the slanting lines of the dados kept dark, relieved only with a few bright lines; the rest of the wall in each story is treated with a foliage design on a warm grey ground, with white flowers; the upper stories a lighter in tone, and simple in scheme; the whole is in admirable taste and keeping; a panel with "decorative heads" (we suppose we must say) on the second story gives nearly the only piece of positive colour. Mr. Edis's "157, New Bond-street" (1,132), is a very effective drawing of a rich and handsome street front, not in very pure taste, but striking, and we might say "showy," which is not out of keeping with shop architecture. The drawing gives a more profusely ornamented effect, perhaps, than is conveyed by the building itself. The interior of the "Dominican Church, Waterford" (1,134), by Messrs. Goldie & Child,† is a highly-coloured and elaborated drawing of a Roman design, presenting some originality in the treatment of the roof, the obvious and not unsuccessful attempt to assimilate it to a round-arched style without neglecting the conditions of timber construction. Mr. G. S. Fox's "Design for a Drawing-room Ceiling" (1,135) is good in a general way: it is a coffered ceiling, with panels decorated in colour, but he should not have put landscapes in some of the panels; they are quite out of place. Messrs. E. George & Peto send, besides "Cottages at Pinner" (1,140), one or two other drawings of work of the same type as these, "Hillier's Almshouses, Guildford" (1,149), being another; these are drawings admirably sketched in brown ink, with very artistic effect, and look absolutely like old cottages, so that we really did not know at first whether they were new buildings or sketches of old ones. On the almshouses is an inscription saying that they were founded at such a date, and rebuilt in 1879, by the lord of the manor, &c., and the aim of the architects seems to be to make one think that the new house is the old original one. Now, Mr. Ernest George is one of the cleverest and most really artistic architects of the day, and has done things which combined real originality with picturesque and thoroughly architectural effect: it is a pity for him to take up with this mere archæological hut-building style. Mr. W. Scott's "Design for a Provincial Town-hall," we presume a study merely, has fine points, and is an excellent drawing. Messrs. Crace's "Portion of Ceiling Decoration at Longleat" (1,162) is rich in effect, but in a style we can hardly admire, though it is, no doubt, in keeping with the house. It consists of heavy scroll-work and gilding, enclosing panels, in which are Verrio-like figures. Mr. John Sulman's little drawing of "Stabling at Caterham" (1,165) is one of the most suitable and sensible things in the collection; it may be described as Domestic Gothic, but makes no affectation of antiquarianism, and looks exactly like stable buildings and nothing else. Mr. Webster sends an interesting and forcible pen-drawing of "The Great Barn at Harmondsworth" (1,171), a long building, with heavy timber roof, looking like the nave of a deserted church. We next notice Mr. Norman Shaw's diploma work, a beautifully-executed pen perspective of "South-west View of Adcote, Shropshire" (1,177), a Late Gothic Domestic building with the windows most picturesquely grouped, and far more pleasing than the style he has taken up lately; here, however, as in Mr. Blomfield's house above mentioned, the battlements strike one as unnecessary and incongruous. We are fortunate enough to finish our round with three designs which have some originality of treatment: the "Founders' Hall," of Mr. Aitchison (1,138), it is true, uses the old pilaster order, but with certain small but effective deviations from the orthodox detail, and the way the window-heads are treated between the pilasters is effective and suitable. Mr. G. G. Scott has done something really original in appearance in his "Façade for St. James's Church, Westmorland Street" (1,178), with the bells visibly hung in a range of heavy open arches across the front, on either side of the clock turret; the idea of the design would have been done more justice to with a better and more forcible class of detail. Mr. Ernest C. Lee's "Bank at Colchester" (1,182), is also very picturesquely treated, the upper story oversailing on heavy massive corbels in a very bold manner.

We may have some more observations to make as to some Domestic and other designs passed over in the present notice; though we must confess that there seems little to suggest any remarks beyond approval or otherwise of the drawings.

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* For view of the exterior of the building see *Builder*, vol. XXXVI., p. 699.

† Illustrated in the *Builder*, vol. XXXVI., p. 381.

Value of Property.—The *Metropolitan* has the following items:—The shop and house, No. 10, Finsbury-pavement, and the private residence, No. 17, Moorfields, held from the Corporation for an unexpired term of fifteen years, at a nominal ground-rent of 27*l.* 9*s.*, were sold on Wednesday by Mr. Statham Hobson, at the Mart, for the sum of 3,150*l.* Messrs. Murrell, Scobell, & Masterman sold by auction at the Mart, the freehold property, No. 25, Bush-lane, City, occupying an area of 1,360 ft. at present let under an old lease, expiring in 1884. The property sold for 6,800*l.* Messrs. Newbon & Harding included in their last sale the two residences, Nos. 59 and 60, Gibson-square, Islington, let at 50*l.* a year each, and held for a term of forty-eight years at a peppercorn. No. 59 sold for 700*l.*, and No. 60 for 710*l.*

THE MOSQUE OF CORDOVA.

In our survey of Cordova we took a general view of the town before we ventured to visit the greatest of all attractions, the most noble of all records in stone and marble the city has been able to preserve,—that is, the great mosque itself. We felt it would be a mistake to enter at once the sacred precincts of the cathedral; that we ought, on the contrary, to gain, first of all, a certain knowledge of the surroundings, and acquire the local spirit which would enable us better to appreciate the appropriateness of the great temple of the Mahommedan faith. Hence the stroll through the street, the contemplation of the city from the opposite side of the Guadalquiver, which we described in our previous article on this subject. Now, however, the time has arrived when we must no longer postpone this, the most important of all sights. We know that the mosque was built as a rival to the Caaba at Mecca, and that the most liberal terms were offered to attract the best artificers of Syria and Spain. Abderahman thought that by opening an unequalled mosque, he would suitably inaugurate his reign, and found a dynasty. According to Condé's history, the general plan was drawn up by the king himself, and was so conceived that the mosque should resemble that of Damascus in design, should exceed in size the huge proportions of the mosque of Bagdad, and excel all its splendours. It was destined to become a place of pilgrimage, a Western Mecca, and to be the greatest temple of Islamism, with the exception, however, of that which contains the body of the Prophet himself. Indeed, this very relic itself was taxed to contribute to the greatness of the new mosque, for a bone from Mahomet's arm, and one of the original copies of the Koran, were brought to Cordova. Even to this day it is believed among some of the lower classes that the Sultan pays a tribute to the King of Spain, so that no Christian mass or service may be held in that portion of the mosque especially dedicated to the Prophet. These fanatics consequently call this chapel the *Zancarron*, which is a term of opprobrium, meaning "ass, jawbone, carrion."

The site had been formerly occupied by a basilica, and the Moors, with a sense of appreciation and care that should have served as an example to the Spaniards, did not attempt to destroy this structure till they were certain they could build something better. When they first entered Cordova, after the battle of Guadalete, in 711, they divided the basilica in two, allowing the Christians to retain one half, and converting the other into a mosque. In 786, Abderahman paid compensation to the Christians, and pulled the building down to make room for his great work. This was carried forward with such energy that the gigantic structure was completed in twenty-one years. Theophile Gautier, among other critics, was particularly impressed by this fact:—"When we reflect," says this astute French observer, "that a thousand years ago so admirable a work, and one of such colossal proportions, was executed in so short a time by a people who have since fallen into a state of the most savage barbarism, the mind is lost in astonishment, and refuses to believe the pretended doctrines of human progress which are generally received at the present day; we even feel inclined to adopt an opinion diametrically opposed, when we visit those countries which formerly enjoyed a state of civilisation that now exists no longer. I have always regretted, for my own part, that the Moors did not remain in possession of Spain, which certainly has only lost by their expulsion. Under their dominion, if we can believe the popular exaggerations so gravely collected and preserved by historians, Cordova contained 200,000 houses, 80,000 palaces, and 900 baths, while its suburbs consisted of 12,000 villages. At present it does not number 40,000 inhabitants, and appears almost deserted."

Approaching the mosque from the bridge, we found the walls of a somewhat unpleasant yellow colour. At first some disappointment will be experienced; there is no grand view similar to that obtained of a Gothic cathedral rising in the centre of an elevated and open space. We approach, on the contrary, a comparatively low and dirty wall; and it is only by walking in its shade for a long time that the magnitude of the building gradually dawns upon us. We refuse to avail ourselves of the first side entrances. To our left we pass with a hasty glance at the episcopal palace, a worthless structure, built in 1745, bedaubed with a profusion of gilding, marble, and whitewash, as if mere glitter were synonymous with good taste, and hasten forward to pay indirect homage to Moslem triumphs. Soon a larger door than the rest offers itself, and this temptation can no longer be resisted. We pass under the horse-shoe porch, and find it is the side entrance of the Court of Oranges. Here are the historical trees, with their golden fruit still ripening in plenty amidst the leaves that look as if they were covered with a dark green enamel. This court is purely Oriental, though the bronze plating over the doors has both Gothic and Arabic inscriptions, which were restored at a comparatively recent date. The court itself was built by Said Ben Ayud, in 937, and nineteen aisles of the mosque opened on to the court, thus giving the freest ingress to the air after it had been cooled under the shade of the orange trees and by passing over the fountains; but this wise provision to mitigate the effects of the hot climate was not appreciated by the Christians. They, on the contrary, walled up the doors which had been so carefully provided; they shut out the view of the wonderful arches, colonnades, and aisles, lighted by hundreds of silver lamps; obliterated the arches with bricks and mortar, and veiled the arabesques with whitewash. Now there are only three doors leading into the mosque, and from the outside nothing can be seen.

The impression on entering is very difficult to define, and is altogether novel. We look up in vain for the lofty and gracefully-arched nave of the Gothic cathedral, and we miss the huge ponderous dome of the Roman architecture. But what a forest of marble columns surrounds us, forming endless avenues from whatever point we may look. If the Gothic cathedral reminds us of lofty trees with branches high in the air, tapering towards each other, forming a great avenue with two smaller avenues on either side; the mosque also recalls a forest, but it is a maze of short, stumpy, hardy trees, which combine, not to make one great avenue, but hundreds of smaller roads leading through a real forest of trunks. Out of the 1,200 monolithic columns which formerly existed within the mosque, 1,096 still remain; it is, therefore, no exaggeration to say that the columns equal in number the trees of a forest. This Arabian style of architecture may, consequently, claim the honour of deriving its inspirations from nature with as much reason as the Gothic school. The comparison with the forest holds good in the one case as in the other, but the interpretation of the same idea is widely different. At Cordova the columns are so placed as to make nineteen transepts and thirty-six naves! Each nave and transept is formed between rows of superimposed arches, some of which cross and combine with one another, and from whatever point we may stand avenues stretch out just as the spokes of a wheel travel away from the axletree. These columns, each hewn out of solid marble, are barely more than 10 ft. or 12 ft. to the capitals; they are full of force and elegance, and in style seem to be an Arabian adaptation of the Corinthian idea. The materials with which they are composed are also remarkable. The jasper, the porphyry, the green and violet breccia, may here be admired, and the archæologist will probably recognise some among them as most ancient, and admit there is good ground for the belief that they are remains of the old Temple of Janus which stood on this site in the times of the Romans and the Carthaginians. The fact that this spot has been consecrated to no fewer than three religions, and that the stones which constitute the actual building have been raised by Pagans, by Mahommedans, and by Christians, adds in no small degree to the interest of the surroundings. The stones that recall so many religions also remind us of different countries. One hundred and fifteen columns are said to have been imported from Nîmes and Narbonne in France; sixty came from Seville and Tarragona, in Spain; while 140 were presented by Leo, emperor of Constantinople. The remainder were, for the most part, taken from the temples at Carthage and other towns of Africa. Under such circumstances, it is not surprising if they do not match; but this irregularity renders, in any case, a comparison with the trunks of trees all the more appropriate. In several cases the shafts are so long that the column had to be sunk some feet below the floor, while others are so short that it has been necessary to add capitals of disproportionate size. The roof upheld by these pillars was originally flat, and is now only about 35 ft. high, while the width of the interior makes it look even lower.

The lowness of the building, the scarcity windows, the dark rich colour of stained glass, the contrast with the glare of the Spanish sky outside, all help to produce an impression of great darkness when the visitor first enters the mosque. This was not so, however, in the origin. The natural darkness of the building only added to the light of the 800 silver lamps, filled with aromatic oils, which illuminated the long aisles, reflected on the sparkling jasper, and the porphyry. The gilt stars in the ceiling shone by the side of the crystal mosaics, and verses of the Koran blended with flowers and arabesques. The soft light of the lamps enhanced a hundred-fold this style of decoration, and gave to the whole a rich, mysterious aspect, admirably adapted to the solemn rites inherent to the worship of Mahomet. But all this splendour remains only on record. The silver lamps have all disappeared; the Christians have recaptured the bells of St. Jago de Compostella, which the Moors had won in battle; and, turned upside down, had suspended them with silver chains, so that they might serve as lamps to illuminate the Temple of Allah. The wooden flat roof which Abderahman had built of cedar and larch has been replaced by arches and half cupolas, and all the magnificent decoration of the old ceiling has disappeared. The floor, on its side, has been bricked over, so that a part of the pillars is concealed, and the original fault of lowness in structure is intensified. These are, however, comparatively slight acts of profanation when compared to the deed of barbarism committed by the Bishop Alonso Manrique, in 1523. Since the year 1238 the mosque had been converted into a Christian church, dedicated to Sta. Maria; but no one had thought of pulling a part of the building down and constructing in the middle of this triumph of Arabic architecture a ponderous Roman Catholic Church. There it stands, however, right in the centre of the mosque, like a huge wart,—a troublesome parasite, disfiguring the Arabian edifice. To the credit of Spain it must be recorded that the greatest of Spanish kings fully appreciated the folly that had been committed; and, to the honour of Cordova, it should also be stated that the *ayuntamiento* did all in their power to prevent this desecration. It was the bishop who proposed the change, the chapter who supported him, and the local government, or *ayuntamiento*, who resisted tooth and nail. Unfortunately the king, who knew nothing about the locality and the splendour of the mosque, sided with the bishop, and gave his consent. When, however, in later years, he visited Cordova, and saw what mischief had been wrought, he turned sharply round upon the bishop and chapter, and, reproving them, exclaimed,—"You have built here what you, or any one, might have built anywhere; but you have destroyed what was unique in the world!"

This comparatively modern church, built in the middle of the old and magnificent mosque, might elicit some admiration, if it had been constructed elsewhere, and if visitors were not so irritated and scandalised at its intrusion that they refuse to be pacified by the contemplation of its beauties. The fine brass balustrades, the splendid pulpits, the *Silleria* with its 109 seats, though a striking specimen of Churriquera art, the *Retablo* painted by Palomino, all these things fail to excite our admiration. It is not for this that we came to the mosque; the same and much better may be seen nearer home. We had read Victor Hugo's lines:—

> "Cordoue aux maisons vieilles
> A sa mosque où l'œil se perd dans les merveilles,"

and we at once concluded that the greatest marvel of all, though the most unpleasant of sights, was precisely the introduction of all these objects into a place where they could only spoil and be spoilt by the force of contrast. A few steps fortunately sufficed to take us away from this monstrous anomaly. We were once more surrounded by the Moorish columns, and finally reached the *Mihrab*, or sanctuary. No words can express the beauty of the arabesques, and we felt almost inclined to breathe a prayer to the memory of Alonso el Sabio, who, in 1275, had the wisdom and liberality to sanction the employment of two Moorish masons and two Moorish carpenters to keep the cathedral in repair, and decided that they should be allowed to live at Cordova free from all taxes. This accounts for the excellent preservation of at

least some of the Moorish remains. Never did Arabian civilisation reach a higher level than that illustrated by the unparalleled combination of colour and the beauty of design displayed in the ornamentation of the *Mihrab*. In gracefulness, richness, and harmony, it is unequalled, and it is with the greatest difficulty that we could tear ourselves away to examine, at the bidding of our guide, such comparatively insignificant trifles as the tusk said to have belonged to an elephant employed to assist in building the mosque. Then General Concha's tomb must be visited; close to it are texts from the Koran, which have recently been disclosed by the removal of whitewash, plaster, &c., and this leads us to hope that many other *chefs-d'œuvre* may be thus discovered. These, however, must be spoilt to some extent; as, for instance, the walls of the *Capilla de los Reyes Moros*, where the colours of the arabesques have been tarnished by the whitewash with which the Spanish fanatics sought to wipe away the memory of the Mahommedan creed. The bitterness of this contest between the Spaniard and the Moor is thoroughly stamped on all we saw at Cordova, and must produce on those who are imbued with the tolerant feelings of this century the most unpleasant impression. Respecting neither learning nor art, nor that which was useful and great, unable to appreciate the refinements of a higher civilisation, the Christians, when they at last reconquered these southern provinces, only thought to obliterate the glorious memories of the past, because they were not of their own creating, and reflected honour on those who held a different creed. A greater nation, and a nobler race, would have attempted to show its superiority, not by destruction, but by achievements yet more sublime. Unfortunately, it was the inferior people who conquered,—it was a triumph of barbarism over civilisation.

COMPARATIVE COST OF LABOUR IN ENGLAND AND IN JAPAN.

A RECENT discussion at the Institution of Civil Engineers, on a paper, contributed by Mr. W. F. Potter, descriptive of railway work in Japan, is of interest, not only for the information which it gives of the state and progress of public works among that remarkable people, but also as furnishing facts which possess much significance with regard to the relative prices of work and wages in Japan and in England.

Since 1869, when the line from Yedo to Yokohama was commenced, sixty-six miles and a half of railway have been completed, and are now in working order. The portions of railway which form this aggregate are:—The line from Yedo to Yokohama, of 18 miles long; that from Kobe, on the southern shore of Japan, to Osaka, also a southern port; and that from Osaka, 26¼ miles long, across a narrow neck of land, to Kioto, a central point of great importance. One hundred and forty-two more miles of line are surveyed and laid out, the sections, working plans, and estimates being complete. These lines will put Kioto in direct connexion with Otzu, on the great inland lake Biwa; with Tsuruga, on the northern coast of South Japan; with Kanu, which will hereafter be an important junction; and with Mya, situated at the head of one of the great bays which so deeply indent the southern coast of the island. From Kanu a line is projected through the central district of Tanaka, whence the rail runs on in two directions, one to Niigata, on the north coast; the other curving round to Yedo, with a northward inland branch to Utsonomya. This projected group of lines amounts in all to 455 miles, making a total aggregate of 664¼ miles. As far as it is possible to form an opinion, great judgment appears to have been shown, both as regards the general course of the lines laid down, and the selection of the small, but busy sections first opened for public traffic.

An especial peculiarity of the Japanese is the manner in which they continue to avail themselves of the best services of Englishmen and other foreigners, while, at the same time, they keep them so much in the dark, with regard to everything but their own especial duty, as to leave the Japanese perfect masters in their own house. Thus, while availing themselves of the services—evidently very valuable services—of English engineers for their railways, the Japanese have allowed them no control whatever over expenditure. A large staff of Japanese officials was appointed, who arranged all the contracts, and made all the payments. When an engineer required materials or labour, he had to make a demand, or as Mr. Potter expresses it, to "indent," upon these officials, who furnished them without giving any information as to the cost. It is natural that the foreign engineers should not approve of a method which so exclusively confines them to the position of special experts, only called in as far as required. It is not so sure that the Japanese have not shown much political wisdom by the arrangement.

The chief peculiarity of the engineering features of the Japan railways arises from the fact that the beds of the rivers are nearly all higher than the level of the country through which they pass. Thus, when the railway has to be led across what we should call in other places a river valley, it is by an ascending gradient that the river has to be reached. In the sections which are attached to the paper read, the line of rails is very slightly raised above the water-line in the five instances which are shown of river bridges. In the case of a navigable river, the cost of bridging would be materially increased by this result of the long care given by the Japanese to the maintenance of their river banks. Something of the same kind is going on in some portions of the River Po, in Italy, and in most rivers that are not fully open to the tide.

Our present object, moreover, is not so much to inqure into railway engineering in Japan, as it is to form some idea of the degree of competition to which the English workman may possibly be exposed from the Japanese workman. In all features of trade disputes, the question of foreign competition is one which experience shews to be likely, sooner or later, to exert a controlling influence. A people that depends on free trade will be unable permanently to shut out free trade in labour. It is thus most important for us to learn exactly those facts which the jealousy of the Japanese Government has done its utmost to prevent us from ascertaining.

The prices which Mr. Potter gives as a fair average of what good railway work can be done for in Japan under the present system, as far as they go, may be taken as about equivalent to those which obtained in this country in the early days of our railway construction. Thus between Kobe and Kioto the price of bricks in the kiln is given as 38s. per 1,000; and timber of from 12 in. to 18 in. square. at 10d. per cubic foot. The price of the timber, however, increases rapidly with the length of the stick; white pine from 24 ft. to 30 ft. long being priced at 2s. 8d.; and teak of the same length at 4s. per cubic foot. Brickwork is priced at 28s. the cubic yard, a Birmingham price in 1835; rubble masonry at 29s. per cubic yard, which would be high for this country. Earthwork is priced at 10d. per yard, but as nothing is said as to "lead" it is impossible to derive much information from the quotation. If the price includes lead up to a quarter of a mile, it is close upon English prices of 1835.

While work and materials are thus by no means much lower than was the case in England when we began our great series of railway works, the price of labour is only about one-third of that now current in this country. The workmen, Mr. Potter tells us, are extremely intelligent and industrious. The carpenters are extraordinarily skilful in the use of the adze, and until a person is accustomed to their work it is alarming to see how they place a bare foot on a bit of wood, and adze away within an inch of their toes. As to the length of the hours of work, or the proportionate quantity of work done in any way that can be measured (as, for example, in superficial feet of timber sawn), it is curious to remark that no one took the trouble to put any question during the discussion.

Three classes of excellence are allowed among the workmen, the pay rising with the class. Thus a carpenter earns 1s. 3d., 1s. 5d., or 1s. 8d. per day; a blacksmith, 1s. 3d., 1s. 5d., or 1s. 6d.; a mason or bricklayer, 1s., 1s. 3d., or 1s. 5d.; and a coolie or unskilled labourer, 8d., 10d., and 11d. These prices are so low that it is difficult to reconcile them with the prices quoted for brickwork, masonry, and earthwork, except on the supposition that the amount of labour actually rendered is only in proportion to the pay.

The importance of this question, as bearing on the future of English labour, is so great, that we shall be very glad to find that either Mr. Potter, Mr. Cargill, who spoke with great knowledge of Japan, or any correspondent of our own, will throw light on the subject. It may be confidently laid down that there exist, for every country, normal prices, at which the greatest amount of good work is given by the workmen. Increase on these prices is as mischievous, in the public interest, as decrease. The great point is to ascertain, in each case, what the true balance is. Prices in Japan are low. But they have to be compared, on the one hand, with the cost of living; on the other hand, with the amount of good work which the carpenter, for instance, will turn out of hand in a day for 1s. 8d. wages.

It should be fresh in the remembrance of those of our readers who are themselves practically acquainted with the work of the carpenter or the joiner, or with any detail of the builder's craft, that a competition to a certain extent has already sprung up between Japanese and English labour. Our own columns have recorded cases where steam vessels have been fitted up with woodwork not only prepared in Japan, but fixed by Japanese workmen; nor will our readers have forgotten the remarkable contrast to which a correspondent lately called attention as to the interest displayed by foreign and by native workmen in the prompt completion of their work. In America, in spite of a resistance which threatens to become an armed opposition, the steady, silent influx of Yellow labour is assuming proportions of very serious magnitude, and the conflict between the principles of American Republicanism, and those of free trade and political economy, cannot, in all probability, be very long postponed. It is for these reasons, among others, that we are anxious to take every opportunity to throw light on the question of normal prices. If England could be as isolated from the rest of the world as was the case a thousand years ago, it might be possible for English workmen, if they adopted a perfect organisation, to regulate the price of labour. With the Channel, and even the Atlantic, bridged by steam, such a project becomes every year more wildly impossible. There is no forgotten nook of the world from which competing produce, or competing labour, may not at any moment come. We are on the way, there can be but little doubt, to such an equalisation of prices all over the world as will be regulated, not by grains of silver or of gold, but by the proportion of comfort and of luxury, in each particular locality, that can be earned by so many hours' work. As to the general tendency there can be no doubt. The rate at which the movement will proceed it is, of course, impossible to forecast. All that is certain in the matter is, that any violent attempt to interfere with this self-adjustment of prices will be likely to involve disaster and suffering. And therefore, again, we ask, what does the Japanese carpenter, mason, or smith give, in time or in work, for his wage of less than two shillings a day?

CONDITIONS OF LIFE IN INDIA.*

THERE is such a complete difference between the Presidency towns and the country beyond that residents whose duties do not call upon them to make tours, such as Judges of the Supreme Courts, advocates, merchants, and bankers, have little more acquaintance with the interior of India than is to be gained whilst rapidly travelling to and from one of the hill sanitaria. It will appear further on why there should be so little anxiety to go about India on pleasure excursions. At the Presidency the civil engineer will easily observe that the greater rewards of Indian service are not attainable to his profession. The secretaryships to Government, Railway, and Public Works Department, and agency of the Guaranteed Railway, comprise almost the only positions he can expect to reach, which are all as well paid as are those filled by the upper administrative class. He will perceive that while a considerable number of appointments of the higher order, such as those in the Political, Educational, Forest, Postal, and Telegraph services, are open to members of the Military and Medical services, the Civil Engineer of the Public Works Department is confined to the restricted grades in the latter. While young officials of other branches of the service are constantly selected for places that lead to the most important kind of offices under the Indian Government, such as residents and Political Agents, it would excite some surprise if a civil engineer expressed a wish to take a share in public administration. In fact, of two

* See p. 473, *ante*.

candidates of the same age,—one a young gentleman of literary education, and the other who had added to this the theory and practice of engineering,—the former, or purely literary candidate, would be preferred by the dispensers of Indian patronage, as if the technical attainments of the engineer were an incumbrance fit to weigh down the possessor through his whole term of active service. In consequence of this the engineering profession takes a very moderate social prominence in India, as may easily be seen by conning the lists of official precedence. There is little more trouble taken about the newly-arrived Public Works officer than gazetting him to his out-station.

It is a befitting time at this juncture to notice what are the peculiar conditions under which an individual taking service under the Indian Government comes. Some are of a universal nature, others appertain to the Public Works Department. Upon landing, the newly-arrived European cannot but be struck with the pallor and want of robustness that characterise nine-tenths of the white race he encounters. He remarks the prolonged stare at him as he passes, as if the distance between vision and mental perception was traversed slowly. Besides pallidness, there is a visible decline in health from a European standard in most Indian residents. This alteration is real, and not imaginary, and it begins to tell on a new-comer as soon as he gets into contact with the Indian atmosphere. A newspaper has well described in what it consists, and the passage is worth adducing, as it clears up many things observable in India that admit of no other explanation:—

"The *Englishman* writes:—'One of the first effects of the climate of the Indian plains, from which probably, though it may not strike every one, no European is exempt, is a diminution of the intensity with which visual images are impressed upon the brain. To a certain degree the case with all objects, this is especially the case with an extended scene. Though with the eye we see, or seem to see, much the same as ever, the brain seems to respond less vividly to the impulses conveyed to it by the nerves of sight; or, to use a metaphor which exactly fits the case, it seems so hardened as to be susceptible of a superficial impression only, where it would formerly have taken a deep one. . . . . The impressions conveyed through the other senses do not appear to be affected by climate in so marked a way; though we are not so sure that something of the same sort does not happen in the case of sound. But it is hard to believe that the deadening process does not extend to all the senses, and to the nervous system generally. The brain probably works more slowly: volition is excited less easily; the nerves convey the message at a lower rate of speed, and even the muscles themselves respond less promptly. If we are not mistaken, a set of experiments to ascertain the average 'personal equation' of a hundred European residents of the plains of India and a hundred of the same class at home, taken indiscriminately, would show a result very much in favour of the latter; while a hundred natives would yield a much worse result than even the former. The comparative slowness of movement of the natives under ordinary circumstances is most marked. In every handicraft, as well as in the less special movements of ordinary life, it is painfully obvious. We impute it to laziness. But it is something less culpable and less remediable than that."

It is a singular thing that natives of India are quite insensible to the charms of landscape. Even Europeans in India scarcely ever allude, except in the most cursory way, to the scenery of the country. It is carried so far with the natives, that, while able to follow a plan, they are unable to understand a picture. If a native gentleman whose education has been solely in the vernacular is given a number of the *Illustrated London News*, he will turn the engravings upside down in looking at them, and it is probable that they convey no idea of the scenes which they depict. When a European who has been some years in India revisits Europe, as the writer actually found in his own experience, the first land in Europe he sights,—for example, Italy,—seems positively painted, so heightened are the tints from those to which he is accustomed. The fact is, that the colouring of Indian scenery only bears a resemblance to that of a temperate climate for from half to three-quarters of an hour each day before sunrise has fully taken place. It is only then that the air has the cool and grey quality which allows hill-side and meadow to wear their gayer tints. In former times the great attraction to India was neither the beauty of its scenery nor the healthfulness of its air, but that nominations were given away so far as recipients were concerned for nothing, and a provision for life to be attained by satisfying the tests applicable to an ordinary liberal education, was too excellent to throw aside. Since the abolition of the East India Company in 1858, aspirants after Indian appointments have had to depend upon their own exertions to obtain them, and to go in for this line of occupation as they would embrace any profession elsewhere. The attraction of India which has determined choice of the country has mainly, if not exclusively, been the high rate of pay obtainable by European public servants in the East. The salaries of the heads of departments and superior officers of state, actual governors excepted, are not much in excess of those given either at home or in foreign countries. Where the principal inducement lies is in the salaries during the early periods of service being greatly beyond what are conceded out of India. Where a young man would consider himself lucky in starting on 150*l.* a year in England, going to India puts him in possession of from 400*l.* to 500*l.* a year, supposing the rupee as it once upon a time was at par of exchange, so that to those so situated as to make a good income at the outset indispensable, Indian service presents very great enticement. These persons, however, are perhaps the last to reflect how it comes that the country can afford to pay high salaries to youthful servants. A little attention to the altered prospects of longevity by going to India will throw some light upon the question. People may not be aware of it, but they live under a materially different law of mortality from that to which they are subject in a temperate climate. It would appear that between the twentieth and thirtieth year the risks to life are nearly the same in India and England. From the thirtieth to the fortieth those risks are doubled in India, while during residence between the fortieth and fiftieth years the mortality in India is quadruple that of England. After the age of fifty-five the Indian civilian is superannuated. So that in reality the Indian Government pays a high figure to secure agents, who, up to the age of thirty, can with comparative impunity make the same exertions in the tropics that they are capable of at home. It would not do to stint them of the means of producing influential results till advanced in their career, with so many chances of their not surviving to perform their task. Hence, Europeans in India cannot economically be long kept in ill-paid subordinate positions. If an Indian public servant adds up the emoluments he has received between the ages of twenty-one and fifty-five, and the successive incomes from twenty-one to sixty-five of one of his contemporaries who has remained at home, he will find the balance is much closer than might have been supposed.

It is usual for writers and speakers about India to descant upon the great variety of languages and nationalities in the country, and to say that the native races differ as much as do Poles and Germans from Portuguese and Englishmen. But the engineers will find that there is a very strong general resemblance between native habits and customs from one end of India to the other, that the races are very uniformly represented in the cities wherever he goes, and that the peasantry are especially alike in their situation, manners, and circumstances. Even the climate is much the same in its effect, the houses have to be built on the same model almost all over India, and the Hindustani or Camp language, a composition of the old Hindu dialect, Persian Arabic, and some stray words of English, is understood over the length and breadth of the peninsula. Take a village of natives in Malabar and another under the Himalayas, and there will be only slight differences, in the daily routine of the inhabitants' existence, their dress, and their appearance. It is true that there are numerous languages in India, but they no more affect the dealings and the political fusion of the population than do the existence of the Welsh, Scotch, or Irish Gaelic interrupt the business relations of the United Kingdom. Such distinctions as do exist in India are of minor importance. They are chiefly of antiquarian interest, and to the newly-arrived European every native he meets seems alike. It takes some time to discriminate Mohammedan from Hindu, and actually in some cases a person is obliged to inquire from the individuals themselves who is who. However, as a general rule, the various castes and tribes are, with a little practice, at once recognisable. The Hindu is fleshy, and has a round shaven face, while the Mussulman is spare, manly-looking, and bearded. The low castes are dark, and the upper classes a light brown. In this way there is a great simplicity in the aspect of native Indian society, and the engineer acquainted with natives in one part of the country is competent to deal with the people throughout all the different provinces.

The East India Company ruled India by dividing it into the three Presidencies of Bengal, Madras, and Bombay. The system is by no means extinct. All their servants were appointed to one or other Presidency, and, with rare exceptions, shared its fortunes from beginning to end of their term of service. Fresh appointments are still made to the Indian service by Presidencies. The result was a great deal of animated and often wholesome rivalry. The distinguishing features of Presidencies are more striking to the European than those presented by the natives. Bengal is much the largest Presidency, and being administered by the Governor-General, contains all the highest appointments to be had in India by the members of the services in the course of ordinary advancement. In consequence, the gentlemen nominated to Bengal have a much better chance of succeeding to one of these than if they had gone to either of the minor Presidencies. For instance, while there is only one chief engineer of the first class each in Madras and Bombay, there are seven engineers of that rank in the Bengal Presidency, exclusive of the secretary to the Government of India in the Public Works Department. The Presidencies differ, not only in extent, and the optical prospects they offer, but in natural peculiarities. The Madras Presidency being farthest south, is, of course, the warmest throughout the year. On the east or Coromandel coast and upon the plains of the interior there is a hot sun nearly every day in the year. It rises about six a.m., and acquires great force by half-past eight, while remaining out under it after ten o'clock is scarcely possible with entire safety. The heat is simply furious, and the sensations excited overpowering. Europeans cannot venture out of doors again till from four to five in the afternoon. The sun sets about six p.m. with scarcely any twilight. It is to be observed that the natives work as a rule during the same hours that labourers exert themselves in a temperate climate, namely, from half-past six a.m. to twelve, and from one to half-past five p.m. Their constitution and diet enable them to stand the heat. The temperature of a native's circulation is at least 1° Fahrenheit below that of a European, so that touching hands the former feels cool to his touch. Besides being hot in Madras during the day, after nightfall the ground gives off its warmth, so that for the greater part of the night it is nearly as hot as in the daytime. Just towards dawn there is a respite, and when sleep is most refreshing it becomes time to get up. So much for the Carnatic districts. On the Malabar coast the climate is totally different. There are lofty hill-ranges which intercept the clouds and condense the moisture, there are sea breezes, and, generally speaking, cool nights. Dense forests give shade, and there is a strong resemblance to the foliage and climate of Ceylon. The thermometer seldom rises much beyond 82°, and for the months of June, July, August, and half September there is almost continuous rain during night and day. It is in this region that the coffee estates are situated, and there are places which rather pleasantly recall the scenes of a temperate climate, and one settlement, Ootacamund, on the Neilgherries, which is as like an English town as India is capable of producing. The Madras Presidency is, notwithstanding the heat, proved to be healthy. This is owing to there being no extremes of temperature, and the proximity of the sea, with its purifying ozone and refreshing zephyrs. The tropical seaboard, though enervating, is always grateful to the constitution of the European, and the moisture of the air wards off the direst rays of the Indian sun. This Presidency has the added advantage of never having experienced the embittering tragedies of the mutiny of 1857. Hence the relations of the Europeans to natives are amicable. The latter have made great strides in education, and large numbers of the business and working classes speak English. In fact, the process of Europeanisation has gone inconveniently far, as a native is not necessarily raised in the scale of civilisation by eating and drinking like an Anglo-Saxon. Expensive tastes and habits are acquired, and these indirectly force up the price of living and diminish the comforts that a European can command in more unsophisticated Northern India. The Bombay Presidency is smaller than Madras. It has coast districts which are situated like those of Malabar, and are, indeed, a continuation of these. But the hills have been denuded of forest, and the consequence is a sunnier climate, but still not unadapted to the European frame. Inland the country is elevated some 1,200 ft. to 1,800 ft. above the sea, and

has a clear, dry atmosphere, without any extremes of heat. The natives know little English as a body, and for public intercourse employ a prattling form of Hindustani which goes straight to the point without any of the superfluous adornments of grammar. The language most spoken is Mahratta, which is one of the purest representatives of the old Sanscrit extant. The climatic features of the south of India last up to about the latitude of Jubbulpoor, after which the Bengal climate succeeds. Most of the Bengal Presidency is out of the tropics. This makes a material difference. The year is divided into a hot and a cold season, which are periods very distinctly marked off. In Madras there is practically no cold weather; in Bombay this only lasts for at most two months; but in Bengal there are six months of cool, and in the majority of localities sharp cold weather. The heat sets in with the reaping of the spring crops in April. There are then strong sirocco winds till the middle or end of June. The temperature in the sun in vacuo is 160° Fahrenheit, in the shade 110°, and the humidity goes down to below 25 per cent. of saturation. The European sits all day behind a netted grass screen in a shady room, with a fanner blowing in cold damp air. By this means the temperature inside a house is got down to 80°. But any out-door exertion has to be performed in one that is extremely different, and heat apoplexy is a possible attendant of incautious exposure. In lower Bengal and the North-west Provinces the periodical rains set in during the month of June. They bring relief from the hot winds, but both the day and night temperature is still very high,—about 92°,—with a clouded sky, and the direct rays of the sun much mitigated. In the Punjab the rains do not come till much later, and the months of July and August are extremely trying, the mid-day temperature being felt as high as 120° in the shade in tents. By the middle of October the cold weather has set in. Mechanical refrigerators are packed away, and by New Year's Day there is frost on the ground and snow visible on the nearest Himalayan ranges. But the sun between eleven a.m. and three p.m. is always warm enough to make the European uncomfortable, and he cannot sit out of doors or wear the same head-gear as he would at home. Such an improvement as this in the conditions of climate is not without its effect on a European. There is not the feeling of weight and uneasiness which down in Madras or Bombay makes the European always think and talk of leave of absence to Europe. Nor do the generality of Europeans age so rapidly as in the south. A person of fifty or more in Bengal has hardly turned grey, and preserves the appearance of comparative youth, while in the other presidencies he may chance to have the hair well turned to white, and the aspect of feebleness due to an advanced time of life. But this can be to a certain extent warded off by frequent visits to Great Britain, which residents in the south of India are well advised to make. The clearness of the intellect is perhaps on the whole better preserved southward than northward, and more literary work used to be done in Madras and Bombay than in Bengal. In the same way there is fully as much physical exertion practised in these, if not more, than in the north. Engineers usually ride to their work, whilst they commonly drive in Bengal. This is partly because the Bengal sun, as it is termed, is really more injurious than where the oceanic atmosphere prevails. The new arrival has thus rapidly surveyed the more prominent characteristics of India, as these are presented on landing at one of the Presidency townships. There are a great number of traits which can only be appreciated after acclimatisation to the interior; and in order to understand the peculiarities under which Indian public works are undertaken, it is necessary to delineate the ordinary routine of provincial existence. This being largely seasoned by relics of the old East-India Company's system will require a digression now and again into the origin and significancy of the traditions of policy with which the Public Works engineer is thickly surrounded, and an explanation of native ways of thinking, living, and labouring.

Social Science Association.—On Monday evening next, the 12th inst., a paper, by Mr. Frederick Hill, will be read, "On Agricultural Distress; with special reference to the mode in which Farm-rent is paid." The Marquis of Huntly will preside.

THE GOLDSMITHS OF MEDIÆVAL FRANCE.

THE business of a gold and silver smith held a high rank in France in the thirteenth and fourteenth centuries. In the industrial census, as embodied in the "Livres des Métiers," and the "Livre Rouge Vieille du Châtelet," we find that there were in Paris at that time 8 refiners, 6 *aneliers*, or gold ring makers; 3 *argenteeurs*, but translated by silver gilders; 40 workers in enamel; 19 coiners (though not in the invidious sense in which we use the word); 14 gold-beaters, or *bateeurs*; 253 gold and silver workers, including two females, who followed that branch. The profession embraced a good many varieties of artisans, such as, for instance, those who engraved the edges of pieces of money and seals. It is true that seals, which were in great request amongst the many corporations and brotherhoods of those days, were properly made by a special body of workmen called *sceleeurs*, but they often fell into goldsmiths' hands as well, for we find a notice to the effect that "Ung nommé de Lachesnel, orfèvre, contrefist les coinga de la monnaie du Roi et ouvra des blans de mauvais aloy"; and again,—"Arnold Bourel, orfèvre et graveeur de seaulx." In one respect, the gold and silver workers were strictly limited, and that was in the trafficking in precious metals. This right belonged to a separate branch of "changers," who had a monopoly of it under a cantion of 500 livres, and who often had occasion to defend it vigorously against the gold and silver smith.

To a certain extent, France was in those days a producer of precious metals, gold being yielded in tolerable quantities from the beds of the Rhine, Rhone, and Vienne, the sand and silt being washed and then tested with mercury. This, of course, was supplementary to the supplies that came from the East; but as regards silver, it is mentioned that in the fifteenth century valuable silver mines were worked near Lyons. Whenever the king determined upon a new coinage, the precious metal required was obtained at as cheap a rate as possible; and to help the carrying out of this part of the affair, all business in it was prohibited for the time,—at all events, at any higher rate than that fixed by the changers. The weight of all gold and silver was strictly limited, refining was forbidden, and, in fact, every possible restriction was put upon the trade; though an instance to which this did not apply was where ecclesiastical gold-work, or that for the royal family, was in hand. Although refining was a special branch of the trade, goldsmiths frequently refined for themselves till the end of the sixteenth century, when they were forbidden to do so. Le Roy, in his "Statuts des Orfèvres-joyailliers," does not mention the invention of the cupel as earlier than 1300; but the monk Theophilus, whose treatise must have been written before that, as also Geber, who lived in the eighth century, both speak of the refining of gold and silver in the cupel. The purity of the gold refined in Paris in the Middle Ages was unequalled, and the penalties incurred by the goldsmith who used bad metal were very severe, extending to imprisonment, the pillory, and banishment, while the work itself was invariably destroyed. The use of the hammer in goldsmiths' work was very similar to what it is in our own time, and the processes of manufacture described by Theophilus and Benvenuto Cellini are almost identical with those of the present day. It is somewhat singular, by the way, that there are few specimens of Parisian goldsmiths' work which throw any light upon the style and technical treatment of the thirteenth and fourteenth centuries, though there are, on the other hand, numerous detailed reports, which tell us more of the forms and taste of their objects than of the minutiæ of their work. Certain specimens are marked by the words "Façon de Paris," or Avignon, or Montpellier, but we are not informed in what these styles consisted, and they simply prove that certain styles were recognisable by these marks.

A curious instance of the jealousy with which trade proceedings were watched in the Middle Ages is shown in the fact that, while gilding was permitted, plating silver articles with gold was forbidden. In 1396 a case occurred of this, in which the Parliament had occasion to deal with a cup or bowl of silver, to which the artist, Albert le Grand by name, had attached a plating of gold. He pleaded that the real nature of the metal was perfectly clear from the weight of the cup and other parts; but the Procurator-General decreed that the cup should be broken and the goldsmith expelled from the corporation. The sentence, however, was not carried out, and the artist was permitted to sell his work quietly; but plating was strictly forbidden from that time forth. Enamelling was very largely practised in Paris in the thirteenth century, and occupied the attention of a special guild, whose laws, drawn up in 1309, are still in existence. At that date it comprised thirty-eight master enamellers and an indefinite number of apprentices and artisans. The length of apprenticeship was fixed at ten years, and all work by night was forbidden. The Marquis de Laborde, who investigated these trades, held that the enamel-workers mentioned in the lists and reports were Parisian goldsmiths who devoted a greater part of their attention to this branch; but this was not the fact, and it merely meant that the goldsmith sometimes undertook to get the enamel-work completed, but it was invariably through that particular [guild, the goldsmith paying the charges and including them with his own.

Jewelry was another auxiliary trade, which, while it embraced both goldsmiths and lapidaries, yet formed a separate brotherhood, under the title of "Cristalliers et pierriers de pierres naturelles," the first-named of whom had the exclusive right of mounting the stones. The statutes of 1355 were very strict, and forbad the workers to cut crystal in the shape of a diamond; to place spangle under an amethyst or garnet; to polish and stain the stones, and especially quartz, so as to make them pass for precious stones; to mount Scotch pearls in gold and silver work by the side of Eastern pearls, except in the case of ecclesiastical jewelry; to set glass beads together with fine stones in silver *bijouterie*; or to stick bits of coloured glass under the very thin precious stones, with the idea of doubling the apparent thickness and lustre. This last process was known as *doubles de voirrines*. In the registers of the Corporation of Goldsmiths is found the following entry:—"*Item*, en leur temps qu'ils trouvèrent un anel d'or où il avoit 'un voirre' et avoit fueilles de saphir, lequel anel Robert du Montacelin avoir fait à un lombert et pour ce fut le dit Robert mis en Chastellet charjié du dit fait." The prohibition of cutting crystal in imitation of the diamond proves that before 1355 it was known how to give the facets to this precious stone. In 1382 a German, named Jean Boule, set up in Paris as a diamond-cutter, and there were about sixteen of the goldsmiths proper who devoted themselves to the cutting of precious stones generally.

The goldsmiths also engraved on fine stones. Theophilus gives receipts for softening and polishing crystal, onyx, beryl, emerald, jasper, and, in fact, most precious stones. Together with the lapidaries of crystal and natural stones there existed a corporation of workers in imitation stones, both cutters and colourers. Their brethren, the true lapidaries, looked sharply after these last, to take care that they did not attempt to counterfeit the crystal with their artificial glass, and the colourers (who were called "verreniers") were forbidden by the Provost of Paris to stain their glass with rose or to cut them into facets.

One curious feature in the goldsmiths' trade was that they sold in their shops a vast number of articles which could not come under the head of gold and silver work proper, but which belonged just as much to the mercers' trade. The Goldsmiths' Corporation had a standing feud with the mercers for selling so many articles of ornament or dress profusely decorated with gold and silver work, and considered that the latter were trespassing on their domain. A petition was presented to the Parliament by the goldsmiths against the farmers of the tax on mercery, so as to try and get an exemption of the tax on those goods which seemed to be, as it were, on the common ground of both goldsmiths and mercers. "Supposé sans préjudice que en tells œuvres vendues par les merciers les d. fermiers devissent preuve l'imposition, toutes voies pour tells œuvres vendues par les orfèvres qui la d. œuvre font, raison ne peut souffrir que il en lièvent imposition." In truth, the goldsmiths sold a multitude of articles which had but slight connexion with that trade, except perhaps that they contained a bit of gold, silver, or jewel work about them, such as game-bags, purses, needle-cases, girdles, hair-nets in gold and silver thread, pins, knives, clasps, writing-cases, bottles, inkstands,—in fact, what in the present day would be called nicknacks. The goldsmiths did not

make these things, and only added a little of their speciality by decoration; but so tenacious were they of their rights, that in 1402 they seized upon a cutler, named Heuze, who had ornamented the handle of a dagger with some silver beads, and did not let him go until he had confessed before the provost of Paris that he had usurped the right of the goldsmiths.

Amongst the other curious prohibitions of the goldworkers' trade, they were forbidden to work at night except in the service of the king, the royal family, the Bishop of Paris, or with the special consent of the heads of the corporation. Every goldsmith marked his articles with a *fleur-de-lis* and his own printed trade-sign, such as a star, a heart, a tongue of flame, &c., which became his guarantee to the public that the work was genuine. In 1378 there were a great many impositions and infractions of the technicality of the trade, and the king therefore ordered the masters of the Mint to break all the *fleur-de-lis* stamps, and to establish another of a *fleur-de-lis* with a crown over it; and no goldsmith's work, except what was marked in this double manner, was accepted on the responsibility of the Corporation.

A COLLECTION OF REPORTED CASES RELATING TO ARCHITECTS, SURVEYORS, AND BUILDERS.*

BY E. S. ROSCOE, BARRISTER-AT-LAW.

Extras.

WHEN it is stipulated in a contract that additions made "by an order in writing" shall be paid for, extras done without such order, even though at the request of the employer, cannot be claimed for by the contractor or builder.—Russell *v.* Da Bandeira, 13 C. B., N. S., 149; 32 L. J., C. P., 68 (1862).

[This is the leading case upon this point of an order in writing for extras. But see Goodyear *v.* Mayor of Weymouth, 35 L. J., C. P., 12 (1865); *ante*, p. 364, which shows that if the architect has certified that a certain sum is due in respect of extras, though no order in writing as required by the contract has been given, the certificate does away with the want of a written order.]

WHEN alterations in, additions to, or deductions from work originally engaged to be done under a contract are not to be executed without a written order from the employer's architect or engineer, and they are in fact executed without such order, certificates under which advances are made by the employer to the contractor from time to time will not do away with the necessity for written orders, without which the contractor cannot make a valid claim for extra work.—Tharsis Sulphur and Copper Company *v.* M'Elroy & Sons, 3 App. Cas., 1,040 (1878).

[This case really confirms a still older decision, viz., Lamprell *v.* The Billericay Union, 18 L. J., Ex., 283 (1849), and the effect of it is as above stated. These certificates, given during the progress of the work, are, according to Lord Cairns's judgment, as has been already pointed out, simply statements of a matter of fact, namely, what is the weight and what is the contract price of the materials actually delivered from time to time upon the ground, and the payments made under those certificates are altogether provisional and subject to adjustment or readjustment at the end of the contract. They are, in fact, only notices that there is sufficient security for any interim payments by way of advances which may be made by the employer to the contractor. This case, therefore, does not seem to be irreconcileable with Goodyear *v.* The Mayor of Weymouth, 35 L. J., C. P., 12, in which the certificate was a *final* declaration by the architect that a certain sum was due to the contractor, although no written orders for extras had been given to him.]

WHEN alterations and additions must be authorised by the architect in writing, sketches of extra work, prepared by the architect, and furnished by him to the builder, are not sufficient authority.—Myers *v.* Sarl, 30 L. J., Q. B., 9 (1860).

WHEN there is a contract to build and complete a house, according to a specification, and certain details necessary for the proper completion of such house are omitted from the specification, the contractor is not entitled to charge for such details as extras, though they are not mentioned *verbatim* in the terms of the contract.—Williams *v.* Fitzmaurice, 3 H. & N., 844 (1858).

[In this case, under the head "Carpenter and Joiner," there was specified the scantling of the joists for the floors, the rafters, and ridge and wall pieces; but no mention was made of the flooring, and it was decided that this could not be charged for as an extra. The specification, coupled with the memorandum of agreement, made it clear that it was unreasonable to hold that the contractor could have supposed that the flooring was intended to be an extra.]

IN a claim for extra work it is necessary to prove by the original contract what is included within such contract, and if this document is inadmissible in evidence for the want of the proper stamp, it cannot be looked at, though not actually required to prove the extras themselves.—Buxton *v.* Cornish, 12 M. & W. 426, 13 L. J., Ex., 91 (1844).

* See pp. 364, 423, 479, *ante*.

THE IRON AND STEEL TRADES.

THE meeting of the Iron and Steel Institute draws special attention to the peculiar condition of the industries of which it is the chief parliament, and which have not only been affected by the general dulness in trade, but also by special causes arising from the state of transition in which they have been for some years. Since the application of the discoveries of Bessemer and Siemens, the iron trade has been literally paling the ineffectual fires of its puddling furnaces, and there has been a continual growth of the steel trade, which at present seems receiving a very great impulse. Hitherto the steel trade has been carried on under difficulties,—difficulties chiefly arising from the limited area in which ores fit for use in the steel manufacture have been found in England, but these difficulties are now vanishing, and the age of steel seems drawing near very fast now. There have been for years attempts to utilise iron made from phosphoric ores in the steel manufacture: these were known to be scientifically successful, and it is now stated on authority that one of the latest is also commercially successful; so that the metallurgical problem of the age is fairly solved. Henceforward, if all is true that is claimed for recent processes, we may look to an enlargement of the area from which ores are drawn in England for the purposes of the steel manufacture, and to a falling off in the demand for foreign ores.

The most striking feature in the recent history of the iron and steel trades is the great cheapening of the cost of production. Not only has this been the case in one, but in nearly every branch. Prior to the strike in the Durham coal trade, pig-iron in Cleveland had reached the price of 34s. per ton, one unexampled in the recent history of the iron trade; whilst for finished iron the rates are as low comparatively; and the fuller adoption of the direct process in the Bessemer steel manufacture has brought down the price until its product is as low as iron, although hitherto the great bulk of the ores for the manufacture of the former have been brought from Spain and other countries rich in purer ores than the bulk of ours. With this increased cheapness there has been a change in the production, an increase in some branches, and a decided decrease in others. It appears probable that steel will, for many uses, supersede iron. In rails this is virtually done, and it is becoming imminent in the plate and angle trade, whilst it is by no means improbable that for foundry purposes ultimately the more enduring metal may be preferred. Hence it was more and more imperative that our native ores should be used for the steel manufacture, and the accomplishment of this and the further reduction in the cost of production which will spring from the use of cheaper home ores, will give an accelerated momentum to the change which has been slowly progressing for some time. Not only, then, in Britain, but generally, there has been a very considerable enlargement of the production of steel, at the expense of the output of iron.

There has been are duction of that outpnt in two methods: by the reduction in the number of furnaces in blast, and by some of the number in operation having been turned to the production of Bessemer pig for the converting-furnaces. This diminished production is general, and is in spite of the enlargement in the average output of the furnaces. It is doubtful whether half of the melting-plant of the kingdom is at the present time at work, and there is no immediate prospect of any great enlargement of the output of iron. Our large export of crude iron has hitherto enabled us to keep up the production; but although that export is rather increasing now, it is in anticipation of an injurious effect from foreign duties in contemplation, the imposition of which would materially affect this branch of the trade. Our home consumption of crude iron is less, and is likely still further to fall as the reign of steel extends,—that is to say, of iron unpurified by the "converter," or some similar method of expelling those vitiating elements which preclude its use in the steel manufacture. In the manufactured iron trade, in spite of prices lower than known for long, it is evident that there is a general dulness which must increase, as steel is used in larger quantities in the plate and angle as well as the bar trades; and the consumption of iron being thus diminished, the trade of the puddler will be more and more in danger. The highly-paid labour necessary in the production of manufactured iron is being less and less in demand, preference being given now largely to a metal the production of which calls only for a limited amount of labour of other than an unskilled character.

The condition of the iron and steel trades, as a whole, is depressed by the falling off of the foreign demand, as well as by the transition from iron to steel, which is now in progress. It is evident that the progress of the changes will materially mould the future of the industries; and that another chief factor will be the fate of the duties proposed in other countries. Hitherto we have had to import a million tons of iron ore, and should the recently-published processes stand the test they will now have to meet,—that of trial on a large scale,—it is probable that we shall find that our imports of ore will show a large falling off, and that there will be a larger demand for the ores that have been hitherto neglected for the steel manufacture. There will need to be an adaptation of our rolling-mills for plates and angles, as there has been for rails; and there may be a removal in part of the industry from some of its ancient seats to others nearer the sea. If we further cheapen the cost of production,—as we shall when we produce steel at the present rates for iron, any falling off in our crude iron trade from the effect of foreign duties will be met in some degree by the growth of our steel trade. We have not had, hitherto, the competition to meet with in the plate and angle manufacture that we have had in the rail trade, because so large a proportion of the former is used in our own shipbuilding and boiler manufacture, in which we retain still the foremost place. But if this is to continue there will need to be an adaptation of those later processes which aid in economical production. It is evident that metallurgy is undergoing a change, and the prospects of those nations which earliest avail themselves in the fullest degree of recent discoveries will be the brightest. It is highly probable that we lost no small portion of our rail trade by the comparative neglect with which many metallurgists here treated the Bessemer process on its introduction, whilst some foreign nations eagerly took it up. It is to be hoped that this folly may not be now repeated; for our hold of many markets is comparatively slight, and to retain, as well as to increase it, we need all the aids that science can give to our natural advantages. In the future, we shall have to improve our products as well as lessen the cost of production; and both these are now made possible, if we will avail ourselves of the means.

Elmore.—The ancient church of Elmore, near Gloucester, is about to be restored, under the superintendence of Messrs. F. S. Waller & Son. It is intended to erect new roofs over the whole of the building, those existing being so dilapidated as to be almost dangerous; to re-floor and re-seat the church, using the interesting old oak seats as far as possible; to generally repair all the stonework of the walls, windows, and doors, and the internal plastering; to repair the tower floors and bell framing, restore the woodwork of the porches, and put a gutter-course all round the church. A tender of Messrs. Gyde & Cox, of Pitchcombe, has been accepted; the amount is between 1,500*l.* and 1,600*l.*, but the work to be at present undertaken will cost between 1,000*l.* and 1,100*l.*

THE SHOREDITCH NEW GOODS STATION.

The Great Eastern Railway Company are incurring a very large outlay in converting what was formerly known as the Bishopsgate passenger station into a huge goods depôt, which will not only occupy the area of the former station for passenger traffic, but will also be extended a considerable further distance northward. The railway level being very much higher than High-street, Shoreditch, the approaches for passenger traffic were by a steep incline from the Shoreditch thoroughfare. This having been found impracticable for the goods and merchandise department of the company's business, the works now in progress have been so designed that the entrance from High-street will be on the street level, the goods being raised and lowered to and from the level of the railway by hydraulic power after passing under arches and roadways beneath the railway, now in course of construction.

The immediate requirements of the company in connexion with their goods business, not less than the magnitude of the new depôt itself, have necessitated the works being carried out in sections. Before the work is completed there will be five contracts in all, and the first of these, which embraces a considerable portion of the south-west section of the station, including about 140 ft. in length of the High-street, Shoreditch, elevation, is being executed by Messrs. Vernon & Ewens, contractors, of London, Cheltenham, and Plymouth. What may be designated the preliminary portion of the works, before the superstructure from the railway level can be proceeded with, is unusually heavy. The old passenger station was built upon arches, and the directors have decided that as the building is demolished the whole of these arches shall also be excavated and cleared away, to be replaced by new arches of a more substantial character. In order to carry out the design for this underground portion of the structure, where all the merchandise will be received, it has been found necessary in many instances to excavate to a depth of 6 ft. and 8 ft. below the foundations of the old arches, and the construction of these new arches, upon which the floor of the warehouses,—on a level with the railway,—will stand, forms one of the heaviest portions of the works. They are built at right angles, and from spacious roadways intersecting each other, with approaches from the thoroughfares, on different sides of the station, for the arrival and departure of goods lorries. The average span of each arch is 32 ft., upon walls 4 ft. 6 in. in thickness, the materials being Staffordshire and red bricks built in with cement. This part of Messrs. Vernon & Ewens's contract has for some time past been completed, and the superstructure is considerably advanced, the High-street elevation having already been carried to a height of 45 ft. This consists of blue Staffordshire brick piers, 5 ft. square, upon which will rest massive iron girders. The upper portion of the elevation, above the ceiling of the warehouses, will be built upon these piers and girders. It will be a neat architectural frontage, 30 ft. in height above the piers and girders upon which it will rest. It will be built of red brick, with a range of white brick circular and segmental windows, alternately arranged, with white brick panels or piers between every third window. Above the windows the cornice will be in terra cotta, surmounted by a balustrade of that material. The entire height of the Shoreditch frontage, from the street line will be 75 ft., and when finally completed will be about 400 ft. in length, extending from New Commercial-street on the south to the new Bethnal Green-road, just opened, on the north. For this extension the company have had to purchase a considerable amount of property. Those portions of the station buildings above the warehouses facing Shoreditch will contain the manager's and general offices for the company's clerks. The whole of the station will be covered in with an iron and glass roof, supported by lattice girders resting on massive iron columns and main girders, and the weight of iron which will be required to complete the whole of the structure may be imagined when it is stated that for Messrs. Vernon & Ewens's contract alone 1,000 tons have to be supplied.

In addition to the new goods station the company are also making a considerable extension to their low-level line immediately adjoining, from the Shoreditch low-level station to Brick-lane. The enlarged low-level line is being constructed on the north side of New Commercial-street, and provides for additional double lines of rails, with new roadways and approaches. It is stated that one of the objects of this extension is to relieve the Liverpool-street station so far as regards the excursion traffic. This portion of the work is being executed by the company themselves, under the superintendence of their own officers.

The whole of the works have been designed by Mr. Langley, the company's engineer.

EXHIBITION OF GAS APPARATUS IN LEEDS.

Under the auspices of the Gas Committee, an interesting exhibition has been held in the above town with the object of demonstrating, in a practical way, the various uses to which gas may be economically applied.

Some time ago their engineer, Mr. Woodall, propounded a scheme for placing a small stove in every house supplied with gas in the borough. But although this scheme met with considerable favour, and was resolved upon by a majority of the council, it had to be abandoned eventually out of regard for another proposition which occupied public attention at the same time. Foiled in this attempt, and still desiring to equalise, as far as possible, the consumption of gas throughout the year, the committee then resolved to hold an exhibition. The result has been an unequivocal success. Up to Saturday last more than 20,000 visitors had paid for admission; and as, in consequence of its popularity, the show was to be prolonged until Wednesday night, it may fairly be inferred that not many short of 30,000 people will have been present. From the outset every effort has been made to break down prejudices in regard to gas as fuel.

The Corporation, superior to the cries of an indignant public, granted the use of their magnificent Victoria Hall for the Exhibition, which, from the very outset, has been used for the display of gas-ovens of all descriptions in full operation. It would be difficult to say what quantity of meat has been cooked therein; but it is a fact that excellent dinners, of seven or eight courses, for as many as eighty persons, have been prepared daily, under the ken of the visitors, who, had it not been for information conveyed to them by the exhibitors, would have been all unconscious of what was going on. The engineer relied throughout for the gas required upon the supply previously laid on, which has proved amply sufficient for all purposes at ordinary pressures. A 3-in. wrought-iron pipe is carried under the gallery, and from this four 2-in. pipes, descending behind the pillars, are laid along the floor of the hall.

The ovens and other apparatus, placed back to back along these lines divide the space into five avenues, an arrangement which is simple in the extreme, and provides a sufficient area for unimpeded circulation.

During the exhibition a series of tests have been applied to the various gas-ovens exhibited, to determine their relative merits, both as regards consumption of gas and saving in meat roasted, the general result of which has been to show that a leg of mutton, weighing 10 lb., can be roasted with 24 ft. of gas, costing at Leeds less than ¼d., with a loss of from 23 to 25 per cent., calculated on the raw meat, and from 5 to 8 per cent. actual loss after taking the dripping into account.

As compared with the ordinary method of roasting before a fire, this result is strikingly economical, for a similar joint under the ordinary conditions loses as much as one pound in excess of the waste in cooking in a gas oven. And as cooked meat is worth not less than one penny per ounce, and the cost of gas employed in cooking rarely exceeds a penny, it follows that the saving is about 1s. 3d. on a joint of mutton.

The Gas Committee are advised that their plant is only worked to one-fourth its capacity during six months of the year, and that a reduced price of gas would inevitably follow the extended use of gas which the above-mentioned economies would warrant. We are informed that during the summer the sale of gas in Leeds is about 1,500,000 cubic feet per day, whereas in winter the sale reaches more than 6,000,000 ft. Practically the corporation could make as much in summer as in winter; and as the charge for interest on plant is nearly one shilling per 1,000 ft. sold, it follows that a reduction of sixpence per thousand could be made at once were the consumption equalised between summer and winter.

The price of gas in Leeds is at present 2s. 6d. per 1,000, and it is contemplated to make a further reduction of 4d. on the 1st of July. To what low figure the price will eventually come it is therefore difficult to estimate, but we may safely augur that Leeds will be one of the last places influenced by the electric light, especially when it is remembered that the illuminating power of the gas supplied is equal to eighteen candles.

In addition to gas ovens there are numerous examples of gas fires producing an excellent appearance and calorific effect at a cost not exceeding (at Leeds) 1d. per hour; and Messrs. Crossley Brothers, of Manchester, show two gas engines, noiseless and admirably designed, which work at a cost of a half-penny per horse-power per hour.

Apart from the mere business-like aspect of the exhibition, endeavours have been made to instruct the public in regard to the processes of manufacture of gas and residuals, by means of excellent models supplied by Mr. Hunt, the engineer of the Birmingham Corporation, and also a complete exhibit of the various substances and colours obtained from the distillation of coal tar exhibited by Messrs. Stainsby & Lyon.

Messrs. Harvey & Reynolds have illustrated to much advantage the value of Mr. Fletcher's inventions, by the melting of copper and other metals in small crucibles heated by gas, and the Leeds Corporation have shown the various apparatus and processes for testing the illuminating power and purity. They have also done what they can to show, through the agency of a qualified cook and laundress, what can be done with the smallest stoves, costing not more than 3s. each.

Altogether the Gas Committee have been very liberal in their arrangements, and we have no doubt that they will have their reward in a largely-increased consumption of gas in the town. And considering the present low price of gas in Leeds, and prospective reductions, we feel disposed to accept for it the correctness of the motto which they display with telling effect in front of the orchestra, "The Fuel of the Future."

THE EXCAVATIONS AT OLYMPIA.

The excavations carried on at Olympia during the first week in April show, we are informed, that the so-called Slav settlement on the east and south-east of the Zeus temple must have been exceptionally dense and extensive. This would account for the smaller fragments from the western pediment being collected together in that spot. Very important portions of the group of Alcamenes have recently been found there, amongst them the trunk of the boy-stealing Centaur, a large fragment of a recumbent elderly female figure, the arms of one of the Lapithæ, who is thrusting his sword into the breast of the Centaur, as well as other fragments. The moulding of the several sculptures has commenced, and it is expected that a considerable addition will be made in the course of this summer to the Olympia exhibition in the Campo Santo at Berlin. That exhibition was reopened to the public on May 1.

WOOD PAVING AT THE NEW LAW COURTS.

The Government authorities wish wood pavement to be laid down in the Strand, opposite the new Law Courts. At last week's meeting of the Strand Board of Works a letter was read on behalf of the First Commissioner of Her Majesty's Office of Works, acquainting the Board that that Department deemed it extremely desirable that the roadway of the Strand fronting the new Courts of Justice should be rendered as noiseless as possible, and that with this view wooden pavement should be substituted for the present granite pavement, from Temple Bar to the west extremity of the new buildings. The letter stated that, as one portion of the building would be occupied immediately, the First Commissioner wished the Board to be informed that he would be obliged by knowing whether the Board were prepared to undertake the work, that Department making a fair and reasonable contribution to the cost. After some discussion the matter was referred to the Works Committee.

YORKSHIRE FINE ART AND INDUSTRIAL EXHIBITION.

THE York Fine Art and Industrial Exhibition was formally opened on Wednesday morning last. We give a view and plan of the building. A portion of the report made by the Executive Committee will serve to show the steps that were taken to bring the undertaking to its present position.

"In the year 1866 a general Exhibition of Works of Art and Industry was held in this city, in a temporary building erected for the purpose in Bootham. This Exhibition remained opened eighty-six days, and was attended by nearly 400,000 persons, the receipts from all sources amounting to 13,000*l.*, and leaving a net balance, after defraying all expenses, of 1,866*l.* These results proved that our ancient city had attractions and advantages which permitted of an Art and Industrial Exhibition being held, not only for the elevation of the taste and social habits of the people, but with a pecuniary result that encouraged the repetition of the experiment, and the committee was continued in office to carry out the suggestion contained in its final report. This suggestion was as follows:—'We are of opinion that it (the surplus) will be best employed in providing some permanent building devoted to the encouragement of art and industry. The securing of an eligible site and building for the exhibition of paintings, &c., would be an appropriate use of the money, and if insufficient for the purpose, might be supplemented by subscriptions or shares bearing a limited rate of interest. We believe that the possession of a building of this description, and a frequently recurring Exhibition of Works of Art and Industry, would be a great boon, and tend to give permanence to that impulse which the late Exhibition certainly has given to the trade and prospects of the city.' Many circumstances arose to delay the carrying out of this recommendation, and it was not till eight years had elapsed that the subject was revived at a meeting of the Executive Committee, held on the 1st of July, 1874, when a sub-committee was appointed to report generally on the subject. The first great difficulty was the site; there were very few spaces available sufficiently ample and at the same time central; and the committee came to the unanimous conclusion that of these none was so suitable as the one on which we now stand, a piece of Crown land, leased to the Yorkshire Philosophical Society and planted as a garden. After long and difficult negotiations (in which we were admirably supported by George Leeman, esq., M.P.) arrangements were concluded with the Commissioners of her Majesty's Woods and Forests and the Yorkshire Philosophical Society, and a lease for 999 years obtained at a cost of 4,000*l.* In the meantime the public spirit of the city was so stirred that a loan fund of 14,000*l.* was subscribed. The plans and specifications were entrusted to Mr. E. Taylor (the architect of the Exhibition Building of 1866), and the foundation stone was laid by the Right Honourable the Lord Mayor (Mr. Alderman Varey) on the 22nd of April, 1878." The floor of the Great Hall and its galleries are filled with a display of manufactured goods, embracing almost all departments of trade, the exhibits in the furniture and furnishing departments being specially important. To the west of the Great Hall is the machinery annex, covering an area of about 23,000 square feet. In this many very interesting manufactures and processes are going forward, the motive power being a powerful engine by Tangye Brothers, of Birmingham, and one of Crossley's "Otto" gas-engines. Adjoining the Great Hall on the eastern side is a spacious lecture-room, where from time to time exhibitions of views by the limelight and chromatic fountain will take place."

The Exhibition stands on a piece of Crown land, formerly known as Bearpark's-gardens, adjoining the Wilberforce School for the Blind, and separated from Bootham and Marygate by the walls erected for the defence of St. Mary's Abbey, and the houses built in the abbey moat. Fronting St. Leonards, but standing back 180 ft. from the thoroughfare, is the permanent building, which is two stories in height at the front and one at the back. The style is Italian, and when completely finished the building will take a prominent place among the numerous objects that arrest the attention and excite the admiration of the visitor to this ancient capital of the north. The front is 104 ft. long, and consists of a central pediment with tympanum, flanked by two wings, and an open arcaded portico or loggia of five arches, with one arch in return. Above the ornamental capitals of the loggia are four circular medallions in stone, filled with heads symbolical of Music, Sculpture, Painting, and Architecture, each represented by four past York worthies, viz., Camidge, Flaxman, Etty, and Carr. On the parapet immediately above are four grotesque terminals, and at the upper corners of the loggia are four carved pilaster panels, while the keystones of the arches are decorated with "swags" of flowers. Each end of the loggia parapet is relieved with a draped vase in stone. In each wing is a doorway flanked by stone columns in pairs, with floriated capitals, and on each side of the columns are oblong ornamental panels. Supported by the columns is a parapet with balustrade, having at each end a pedestal for a single figure or small group. Above the line of these parapets the whole front is divided into seven sets of panels, the upper being semicircular and the lower oblong or square; three are in the central pediment, one on each side of it, and two (with larger square panels than the rest) in the side wings. It is intended at some future time to fill these panels with some of the many striking events in the history of the city, the upper panels in stone and the lower in mosaic. At the sides of the pilasters which support the ornamental semicircular heads above the panels in the wings are niches for figures. When finished the tympanum of the pediment will be filled with sculpture. At each end of the pediment are stands for figures, and the apex is surmounted by an ornamental finial. Over the wings, the upper portions of which are connected with the centrepiece by balustrading, are massive pedestals, both in front and at the sides, which are destined to receive grouped statuary. At suitable intervals between the main figures the upper parapet is ornamented by ten draped vases in stone. The general design of the building, as it will appear when finished, is one in which dignity and repose are judiciously blended, and it will lend an additional charm to the spot about which the chief treasures of the city are clustered.

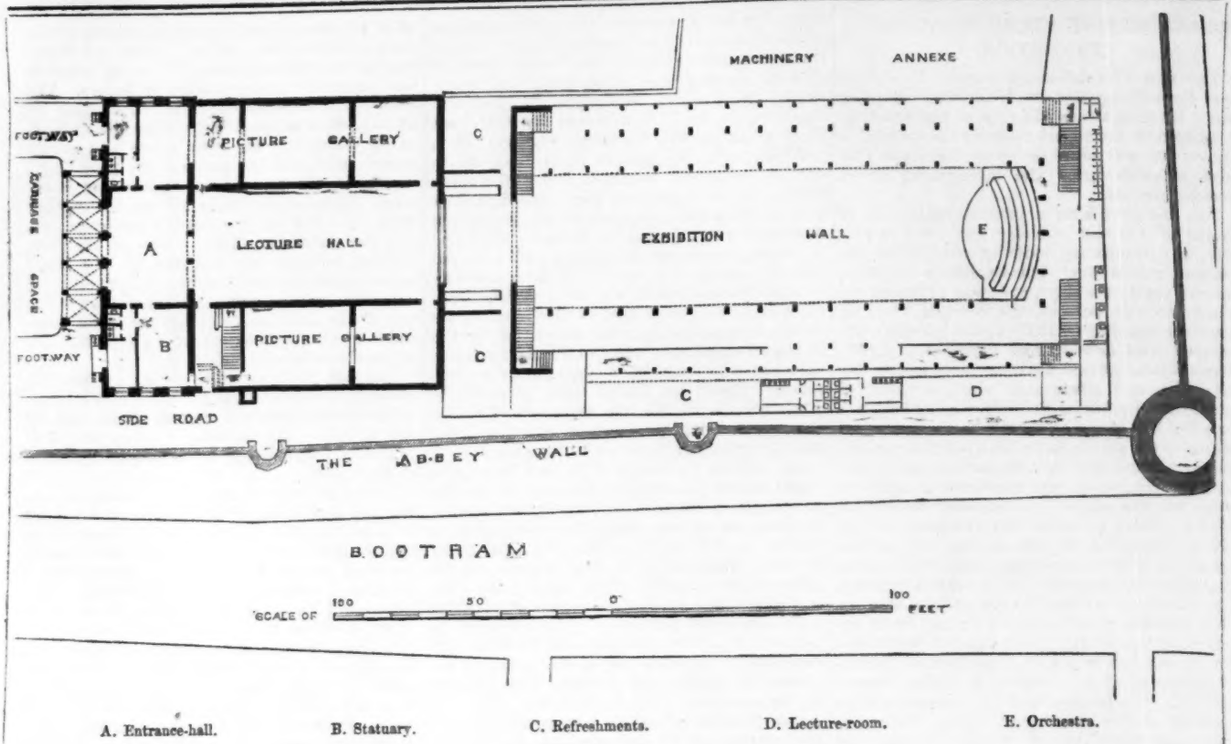
The building is entered from the loggia by three central doorways, 7 ft. wide, and, as indicated, by one doorway on each side of the portico. These open into a central hall, 38 ft. by 29 ft., having on the right master's room, lavatories, &c., and on the left secretary's room and conveniences. The entrance-hall leads directly by three arches, supported on granite columns, into a central lecture or concert hall, 86 ft. long, 38 ft. wide, and 50 ft. high, which has a curved open-timbered roof. To the right and left the lecture-hall communicates with continuous picture galleries. That on the right is in three divisions, the whole being 85 ft. by 29 ft., including a room for statuary, which is separated from the rest of the gallery by the grand staircase leading to the saloon above, while the gallery on the left is in four divisons, and is 107 ft. long and 29 ft. wide; both galleries are 26 ft. in height. This permanent picture-saloon occupies the whole space above the entrance-hall and adjuncts, and is 100 ft. long, 29 ft. wide, and 26 ft. high. Care has been taken to render this room fireproof on Homan & Rodgers's system. Separated from the permanent building by an interval of 25 ft. is the large exhibition hall, a lofty and ornate wooden structure 200 ft. long and 90 ft. wide, with an aisle on each side and galleries 20 ft. wide above and in front. The semicircular roof, relieved with ornamental timbers, is over 60 ft. in height. The story-posts, which afford support to the principals, give off in a line with the gallery front, and above are projections similar to those in the roof, and neat bracketing underneath the gallery line, while the spaces between the posts, all round, are filled with open trussed framework supported on light arches. The gallery front is in perforated woodwork of good design. The organ is placed in the west gallery; it is a fine large instrument,—the wooden pipes by Telford (of Dublin) and the metal ones by Schultz,—which has been purchased by the committee to occupy the centre. The galleries are reached by four staircases,—two at each end of the large hall,—each 6 ft. in width, and of easy ascent. The space on each side of the covered way between the permanent and temporary buildings will be utilised for first-class refreshment-rooms. That on the left, 25 ft. by 25 ft., is intended to be used chiefly for the sale of tea, coffee, cocoa, and other light refreshments. The room on the right has an area of 35 ft. by 25 ft., while adjoining it, and erected in the rear of the main exhibition-hall, are a kitchen and store-room of ample dimensions. A large cellar is also provided for the storage of liquors. The second-class refreshment-room, 62 ft. long by 23 ft. wide, is situated under the right gallery, partly occupying the aisle space and partly extending beyond the limits of the main building, as in the case of the kitchen and store-room. This projection is utilised for another 60 ft. by ladies' and gentlemen's lavatories, &c., and the remainder of the length of the main building on that side is taken up by a small lecture-room and ante-rooms. Underneath the orchestra retiring-rooms are provided for the use of the musicians. Additional ladies' lavatories constitute an extension of the main building at the orchestral end.

Running nearly at right angles to the exhibition-hall, to the left, is the machinery annexe, which covers a space of ground 190 ft. long by 130 ft. wide. The building is in one story, and is divided into fourteen bays, spanned by a roof of five spans.

In the left aisle of the exhibition-hall, adjoining the first-class refreshment-room, are a set of grottoes, and the partition between them and the hall contains some of the choice specimens of stained window work which form a prominent feature in the exhibition. The permanent lecture-hall is lighted from clear-story windows filled with ground glass, while the side galleries and temporary exhibition-hall are lighted with Rendle's patent glazing, the latter having a continuous band of glazing 10 ft. 6 in. wide over each gallery, and a band of the same width on each side of the ridge. The permanent saloon has a long curved skylight filled with ornamental ground glass. Helliwell's patent glazing is used in the skylights of the machinery annexe, to the extent of about 11,000 feet. The temporary buildings are chiefly of red and white deal, the story-posts being of pitch pine. As it is intended that the exhibition-hall shall remain standing for some years, stained V-jointed boarding is generally used in the interior. The whole of the woodwork in connexion with the erection of the permanent and temporary buildings has been carried out by Mr. G. Mansfield, builder, York, and it is estimated that nearly 50,000 cubic feet of timber have been used. The other contractors are:—Mr. J. G. Hebden, York, mason work; Mr. G. W. Milburn, York, the sculpture; Mr. John Thomas, York, painting; Mr. J. W. B. Lee, York, bricklaying; Mr. J. Hawley, York, smith's work; Mr. Charles Nelson, Bradford, plumbing; and Mr. Michael Croft, York, plastering. The works have been carried out under the superintendence of Mr. E. Taylor, architect, York.

The cost of the permanent and temporary buildings, which give an available area of over 55,000 square feet, or 25,000 square feet more than the Exhibition of 1866, is estimated at about 24,000*l.*, including 4,000*l.* for the lease of the site for 999 years; while to complete the adornment of the front, a further sum of 1,200*l.* will be required. Towards this total cost a balance of 2,000*l.* was left in hand from the former Exhibition, and upwards of 14,000*l.* have been promised, chiefly by subscribers resident in the city or neighbourhood, thus leaving a chargeability upon the guarantors of some 9,000*l.*

Large as is the space at command compared with that in 1866, the executive have found it very difficult to meet the wishes of the numerous applicants, and in most instances it has been found necessary to curtail the allotments. The exhibits will be arranged in seven divisions, viz.:—1. Natural products; 2. Manufactures—sub-section, art manufactures; 3. Machinery; 4. Applied science; 5. Educational; 6. Literature and antiquities; 7. Fine art. The North-Eastern Railway Company have lent a boiler for driving the machinery in the annexe. In the fine-art division the collections of most of the county nobility and gentry will be represented, the following, among others, contributing works of ancient masters:—The Archbishop of York, Lord Herries, Lady Mary Thompson (Sheriff Hutton Park), the Hon. Payen Dawnay (Beningborough), Sir H. Meysey-Thompson (Kirby Hall), Sir Harcourt Johnstone, M.P., Mr. Ralph Creyke (Rawcliffe). In addition, the whole of the Earl of Faversham's magnificent collection of pictures and statuary, including "Jennings's Dog," saved in the recent disastrous fire at Duncombe Park, will occupy a prominent place in this department. The



A. Entrance-hall. B. Statuary. C. Refreshments. D. Lecture-room. E. Orchestra.

FINE ART EXHIBITION BUILDING, YORK.—*Plan.*

Jacquard loom will be among the features of interest in the machinery annexe, where all the motive powers—steam, hydraulic, electric, and gas—are represented; and the Secretary of State for War has granted to the committee a loan of various specimens of armour from the Tower of London. A large area of the wall-space in the Exhibition-hall is occupied by specimens of stained glass from the works of the principal manufacturers.

THE STAGE.

A DELICATELY nurtured, educated, and well-brought-up young lady, who takes to the stage, not from necessity, not from love of personal display, or mere desire for excitement, but from a strong conviction that it is her vocation, and that she may so best do her duty to society, is not a common event; and it is for this reason, among others, that we look with special interest at the progress of Miss Rosa Kenney as an exponent of Shakspeare and the classical dramatists of this country. Miss Kenney's performance of *Juliet* is full of promise; her natural aptitude is remarkable, and the representation has a charm of its own which already goes far to indemnify for any want which may be apparent of that mastery of *finesse* and power of inflection which are to be gained only by practice and long study, and has justly obtained for her the applause of a well-filled theatre on two occasions. On Saturday last at the Princess's Theatre, she was ably supported by Mr. Charles Warner as *Romeo*, and Mr. Sinclair as *Mercutio*; and on this Saturday, the 10th, she will essay the character of *Pauline* in "The Lady of Lyons," to Mr. Warner's *Claude*. We cordially wish her success in the intellectual and arduous profession on which she has entered with such high aims and earnest resolves. Our stage will have more such recruits by-and-by, and it will be the better not alone for the stage, but for the people.

St. Alban's Cathedral.—It is reported that the woodwork of the new high roof being completed and ready for fixing, the contractor has called on the Faculty Committee to decide on the covering, which was deferred in order to see whether an adequate amount would be specially subscribed for lead. This has not yet been done, but enough has been subscribed to induce them to run the risk, large as it is, of doing the work in the way that the subscribers generally desire, and they have ordered lead accordingly.

THE SYDNEY INTERNATIONAL EXHIBITION BUILDING.

WE have before now mentioned the International Exhibition, to be opened in August next, in Sydney, and having illustrated in our pages all the Exhibition Buildings which have been erected since their origin in 1851, we give, as a matter of course, a view of the building which has been erected in Sydney for this purpose. The London offices of the Exhibition are at 3, Castle-street, Holborn. On the 7th of February, 1878, the Governor of New South Wales, with the advice of the Executive Council, directed the fact to be notified for general information that it was intended to hold an International Exhibition at Sydney, in August, 1879, under the supervision of the Agricultural Society of New South Wales. Medals and certificates will be awarded to exhibitors in nine sections—fine arts; apparatus of the liberal arts; furniture and other objects for use in dwellings; clothing, including fabrics and other objects of personal wear; products of mining industry, forestry, chemicals, &c.; apparatus and processes used in common arts; food, and cattle foods; artisans' section; school work. Australia is fifth on the list of purchasers of English manufactures; and New South Wales is the eleventh State in the world for revenue. The population of Australia is now 2,500,000, and the import and export trade is 70,000,000*l*. Captain Cook discovered the magnificent harbour of Sydney only a century ago. An import trade of about 6,000,000*l*. from the United Kingdom alone, and of 7,000,000*l*. from British Colonies, with an export trade of corresponding amount, is now conducted by means of this harbour. The exports from England in 1876 to Australia were 19,470,063*l*.

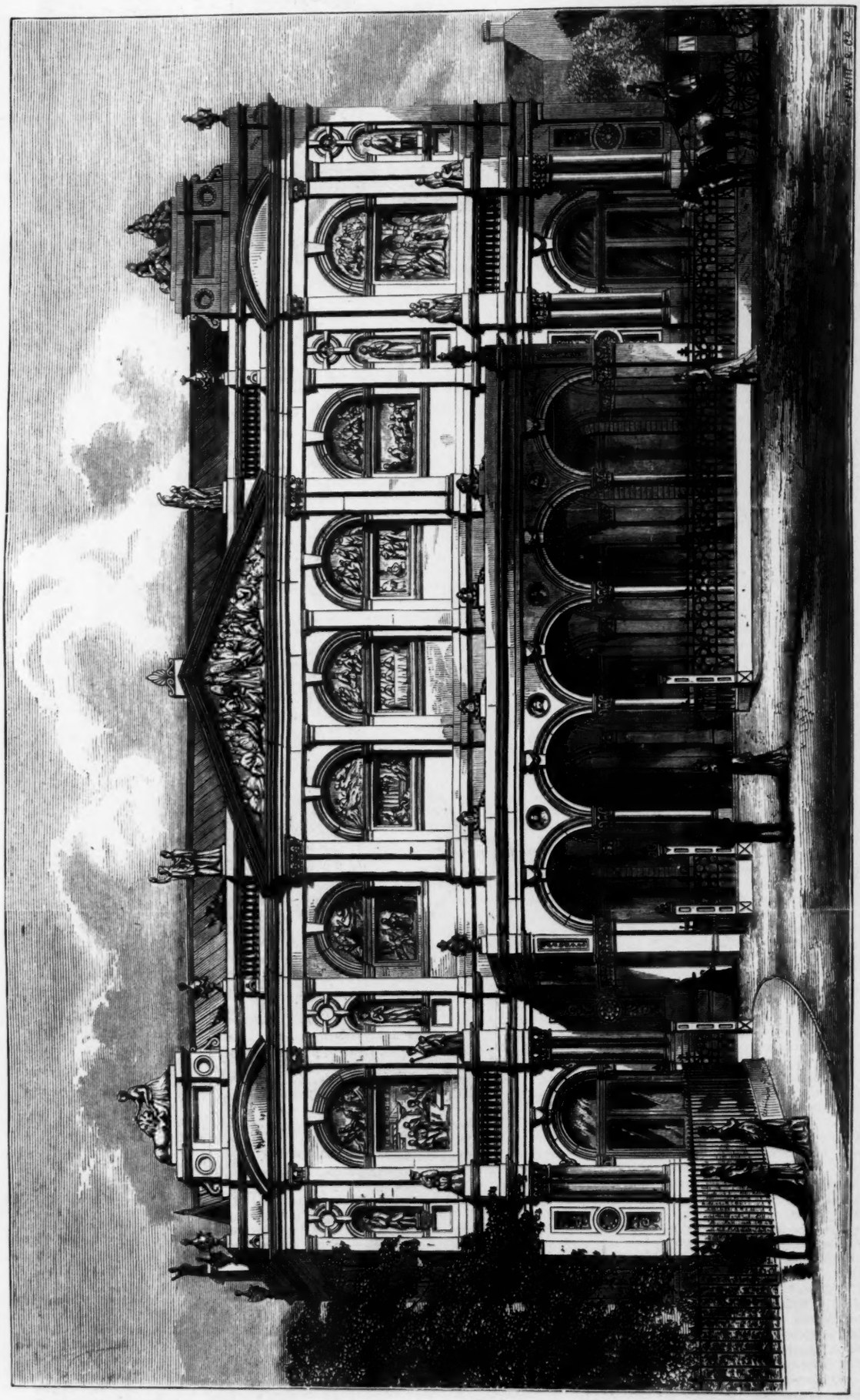
The building, of which we give an illustration, is built in the Inner Domain, and designed to suit a site of great natural beauty; overlooking the Botanic Gardens, the waters of Farm Cove, and the anchorage of her Majesty's Australian squadron; but, from its rapid slope, it presents considerable difficulties to the erection of a building suitable to exhibition purposes. These difficulties have been overcome by facing the building towards the north-east, following as far as possible the contour of the ground, and taking advantage of the fall to obtain on the north-eastern front—as seen in our view from the harbour—two stories, but at the rear, or south-western front, towards Macquarie-street and Governor Bourke's statue, one story.

In plan the building has a nave 800 ft. long and transept 500 ft. long, 50 ft. wide, and 60 ft. high; surrounded by a gallery 25 ft. wide on either side, and of similar length, are aisles 50 ft. wide and 25 feet high; and on the south-western side what may be termed annexes, or continuation of the aisle, 450 ft. by 100 ft., 25 ft. high; on the north-eastern side a basement about 1,000 ft. long, 75 ft. wide, and 20 ft. high. At the intersection of nave and transepts a lofty dome, 112 ft. diameter, and top towers 50 ft. square at each of the four main entrances, break the horizontal line of the structure, erected to afford a fitting although temporary home for the rare examples of industry and art from the various quarters of the world and our neighbouring colonies. The total floor-space provided is 7½ acres; the basement, 1¼ acre; ground-floor, 4¾ acres; and the galleries, 1¼ acre. The building is designed so that it can be reduced or extended if necessary without marring the effect. The basement is lighted from lofty side windows, the aisles and annexes from the roof, the nave and transepts from the clearstory, and the whole ventilated by a novel arrangement for the delivery of fresh air vertically.

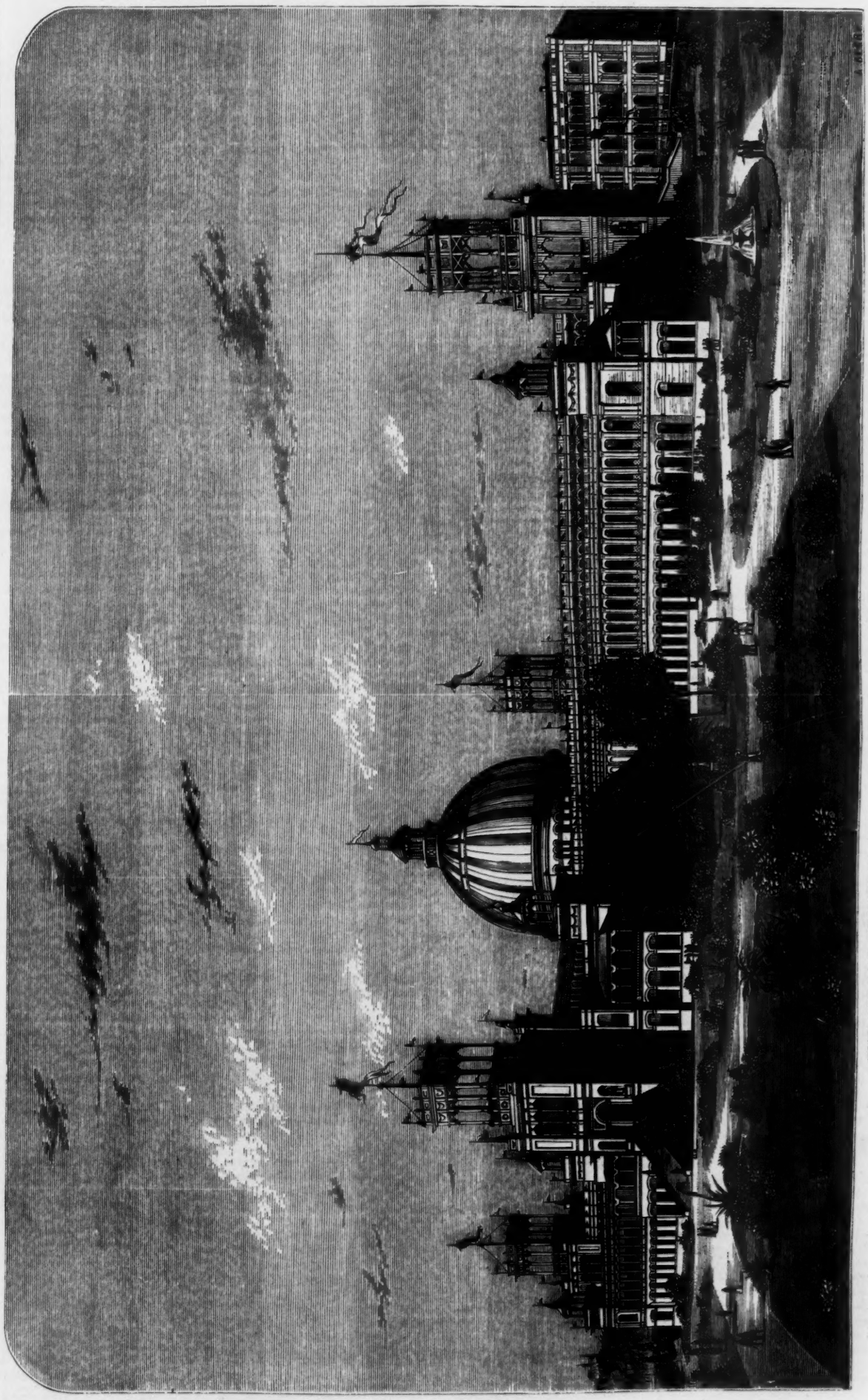
Water is laid on all round the building outside and in, with ample power of extinguishing fire on its first appearance. The electric light has been used to enable the workmen to proceed night and day, to complete the building in time. The design is by Mr. James Barnet, the colonial architect, under whose superintendence the structure is erected.

The foundation, constructed of brickwork, is surmounted by a superstructure of hollow columns, roofed and enclosed with iron, glass, and wood, the materials being so disposed as to suffer the least waste, and with a view to their being utilised again when the building is removed. The erection was undertaken by Mr. John Young, with the co-operation and assistance of Messrs. Hudson, Brothers, of Sydney.

All the space available for the United Kingdom has, we believe, been applied for at the last meeting of the London Committee. The importance of urging upon exhibitors the necessity of arranging, without delay, for the shipment of whatever is intended for the Exhibition was referred to, it being stated that unless immediately notified the Orient Steamship Company would be unable to provide at short notice the necessary tonnage, or to arrange for one or more extra steamers should such be required.



FINE ART EXHIBITION BUILDING, YORK.—Mr. Edward Taylor, Architect.



THE SYDNEY INTERNATIONAL EXHIBITION BUILDING.—MR. JAMES BARNET, ARCHITECT.

CONCERNING THE FABRIC OF THE CHURCH AND THE FORM THEREOF, FROM THE EARLIEST AGES TO THE END OF THE ELEVENTH CENTURY.*

THE title of this paper may seem to some rather too comprehensive as to the first part, and rather too abrupt as to the ending, objections reasonable enough, but as this is the first actual working meeting of the society, it has been thought more advisable to give a rough and general outline of the subject, so that certain salient points may be carried in your minds, rather than to dwell upon details which can be mastered hereafter; and, secondly, as to the apparent abruptness of the ending, the history will be taken up by others at the point mentioned in the title, and most probably dealt with in a far more detailed manner than it is possible to do here.

We bear the name of the St. Paul's Ecclesiological Society, and our intention is to study ecclesiology in all its branches. This word, whose root is *ecclesia*, is derived from the Greek compound of *εκ* and *καλέω*, and in St. John's Gospel, xv. 16, we find the term *ἐξελέξαμην*, which we have translated as "I have chosen you," perhaps better defining the actual meaning of the word than the first aorist of *ἐκκαλέω ἐκαλεσα*, "called forth, summoned," and hence this word "ecclesia," now generally understood as meaning, in its first sense, the church and body of the faithful; and, secondly, the fabric where they assembled.

In the Old Testament there is no record of any temple dedicated to the service of the Almighty before the age of Solomon. The Semitic race during the patriarchal age was nomadic, each tribe being really one large family, the head of which offered sacrifice for the rest, and altars were erected wherever in the course of their wanderings they found pasture and water for their flocks and herds; and when Israel went down into Egypt and sojourned there, it was not until they had been brought out into the wilderness that the tabernacle and its services were first ordained according to the pattern shown unto Moses upon the Mount, and so it remained until the time of David, who, as he sat in his house of cedar, first conceived the idea of building that temple which Solomon, his son (B.C. 1015), afterwards carried out. In 2 Chronicles vi., the account is given of the solemn dedication of that temple, and in that magnificent prayer of consecration there recorded do we find shadowed forth the use of the church when the old law had been replaced by the new, how deep and significant is the meaning which we now attach to his words.

Of the form and appearance of that temple, although its dimensions and ornaments are all so minutely described, nothing is known of a certainty. It might have borrowed forms from Egypt,—the vast propylæa, the outer courts and chambers surrounding the inner enclosure and cell, point rather to Thebes or Karnac; or it might have copied Assyrian or Chaldean forms, which is the more probable.

So utterly had it been given over to destruction, that at the commencement of our era nothing remained. The temple at Jerusalem in which our Lord taught daily was of a far different character. Greatly enriched and beautified with superb additions by Herod, it was but the shadow of what it once was, and sentence had even gone forth against that that not one stone was to be left upon another.

Although after our blessed Lord's ascension the holy apostles were still to be found proclaiming the Gospel among its colonnades and porticos, and although they still frequented and expounded the law in those smaller assemblies known to this day by the name of synagogues, yet it was on that "upper chamber" at Jerusalem that their thoughts were centred, as every detail of that memorable paschal supper and the divine ordinance which followed it became indelibly fixed in their hearts as the thought of how the bread was broken and the cup taken and blessed, and those mysterious words uttered, so soon to become, by the sacrifice on Calvary, of such deep and significant meaning; it is to that upper chamber, where all this had taken place, that in turn our thoughts should be directed as the first visible church of the New Testament.

Follow the history of that infant church: again and again do we find reference to an upper chamber. When the cloud had hidden their Lord from them on the top of the Mount of Olives, it was to the upper chamber they first directed their steps, in the first chapter of the Acts (v. 13), and again in chap. xx. 7, 8, where it is said,—"the first day of the week when the disciples came together to break bread," it "was in an upper chamber, and there were many lights." Such were the first surroundings and the first type of the fabric of the church, a place not to meet in for the purpose of expounding the law, or of simply hearing the word preached; it was a place where the first Eucharist had been offered, and which was to be continued *daily* by those who followed the Apostolic doctrine.

It will be hardly necessary to advert to the form or decoration of such a chamber; we do not require antiquarian knowledge to tell us that it was the "guest chamber," and therefore the best. Holy Writ tells us that, and this type, which had its origin at Jerusalem, spread with the knowledge of the Gospel throughout Syria and into all lands. In Rome itself, where the Apostles SS. Peter and Paul laboured, we have this room alluded to, in the Epistles; it is there called "the Church which is in the house of Priscilla and Aquila." Now this phrase, the "Church which is in the house of," means something more than that body of Christians meeting under the roof of some wealthy convert to Christianity; it probably means the oratory or room in which the divine mysteries were celebrated. But at this period persecution after persecution sweeps over the infant Church, and these little assemblies of the faithful are dispersed; so searching and so rigorous are these persecutions that above ground it is no longer possible to meet with safety, and in the gloomy and tortuous recesses of the catacombs, in fear and trembling, are gathered the remnants of Christ's flock, ostensibly to pay the last duties to those bodies of the holy saints and martyrs whose life-blood had been shed to grace the triumph of an imperial monster and to gratify that craving and lust for blood without which the sports of the arena were tame and spiritless to the Roman people. This hiding-place among the tombs and galleries of the catacombs becomes the second type assumed by the Christian Church. The tomb of the saint becomes the altar, and the vision of St. John the Divine is realised on earth. "I saw under the altar the souls of them that were slain for the Word of God, and for the testimony which they held: and they cried with a loud voice, saying, How long, O Lord, holy and true" (Rev. vi. 9, 10).

Of the danger incurred by the Christians in thus meeting we find several instances, as witness that noble reply of Justin Martyr to the Prefect Rusticus, who inquired of him, "Where did the Christians assemble?" "Where they wish and where they can: do you think we always assemble at the same place? The God of the Christians is not confined within an enclosure, but he is invisible, and fills heaven and earth."

Now there is one curious characteristic connected with these subterranean oratories which must not be passed over in silence. We hear much in these days of simplicity of worship, and the recent storm which was raised when the question of properly and richly decorating our own cathedral church of St. Paul will be fresh in our minds; but here, these underground sanctuaries of the very infancy of the Christian Church, we find adorned with frescoes. The execution may be rough, and the drawing of the figure imperfect, yet there they are unmistakably Christian, and contemporary with others in the same catacombs of Pagan origin. You see, therefore, that notwithstanding the persecutions which had compelled the congregation of the faithful to flee to these dark recesses, the tradition of the "upper chamber" was still preserved, and they tried, as far as their scanty means would permit, to make His sanctuary glorious.

But leaving this subject of the decoration of the church to be treated hereafter in a fuller and more comprehensive manner, we must revert to the architectural form which these oratories assumed.

As the traditional ornamentation of the upper chamber had been impressed upon the chambers used by the early Christians in the catacombs, so in turn did these underground vaults exercise an influence upon religious architecture when Christianity was able to emerge from them into the full blaze of sunshine. Hence the origin of those vaulted crypts so often to be found here and on the Continent. In Rome churches were built exactly over these spots which contained the tombs of the Holy Martyrs. San Martino was built over the subterraneous chapel where the body of the Pope Saint Sylvester reposed. Santa Prassede, San Lorenzo, Santa Croce, San Sebastiano, San Paolo, *fuori le muri*, and last, but not least, the huge basilica of S. Peter, were all over the tombs of the several saints to whom they are dedicated.

In those first centuries of the Christian era, when the blood of the martyrs became the seed of the church, there were intervals of repose, but the last great effort of Pagan malice, the persecution under Diocletian, was the most severe and extensive of all, for it even reached these shores, and St. Alban, the proto-martyr, became its first-fruits. During these intervals Christianity was reviled, as may be inferred from the writings of Juvenal, Pliny, Apuleius, and Tacitus, this last calling it a detestable superstition, but the underground sanctuaries had been exchanged for more commodious buildings above ground, probably the houses of the most wealthy, such as the house of Clemens, of the Gens Flavii, an old consular family, known now as St. Clement, the third successor to St. Peter in the see of Rome, on the site of which now stands the very ancient Church of St. Clemente, and partly under which have been discovered the remains of a still earlier, probably the original. The house of Pudens, where St. Paul lodged on the two occasions he was in Rome, before he lived in his own hired house, now the church of Santa Pudenziana or Pudentilla, the daughter of Pudens, incorporated in the present portions of the original house; therefore that apostolic saying, "the church which is in the house of," as before alluded to, was no empty phrase. It is not likely, or probable, that any building erected by the Christians for the purpose of specially celebrating the Divine mysteries would have survived the persecution under Diocletian. That they did possess churches we know, because in the account given of the martyrdom of St. Laurence reference is made to the prefect visiting the church, expecting to see there the vessels of gold and silver in which he had been informed they offered libations, and also the golden candlesticks in which they burnt their tapers; and when Galerius persuaded Diocletian to issue his infamous mandate at Nicomedia the very first thing done by the prætorian guards was to pull down the church erected by the Christians, and to destroy every copy of the Scriptures.

Having thus arrived at a turning-point in Rome, let us look back at Jerusalem. Prophecy had been fulfilled,—not one stone of that temple had been left upon another; Vespasian and Titus, the instruments of Divine wrath, had utterly destroyed it; and those few of the inhabitants who had escaped from the general massacre had been dispersed into all lands. The account given by Josephus of those last days of Jerusalem is a very fearful one. Eusebius tells us that the Christians in Jerusalem had received a Divine intimation to leave the city, and to retire to Pella, a small town on the other side of Jordan.

But the cities of Asia Minor and Greece, Antioch, Laodicea, Athens, Corinth, Ephesus, and others, all possessed Christian churches, although nothing before the commencement of the fourth century can now be actually identified. It was the accession of Constantine to the imperial throne which changed the face, as it were, of the world, and is the turning-point in its history, to whose reign we must look for those first manifestations of Christian architecture.

Marvellous as were the productions of ancient times in this art, as exemplified in their temples, yet Christianity would have nothing to do with them; and even when Christianity became universal the temples of the heathen were not used for their worship. St. Paul had stood and preached on the Areopagus; he had seen the most beautiful temple of the old world, the outcome of the refined intellectuality of the Greeks, the Parthenon, or the Temple of Pallas Athene, in all its pride of position and magic sculpture of Pentelic marble; he had wandered through the sacred groves of Athens, the violet-crowned, wholly given to idolatry, and had preached from that text inscribed on one of the numerous altars of that too superstitious city,—*Ἀγνώστῳ Θεῷ*, "TO THE UNKNOWN GOD." At Ephesus, for the space of three months, he must have passed daily the

* Read before the St. Paul's Ecclesiological Society, on Wednesday, April 23rd, by Mr. George H. Birch, Hon. Sec. of the London and Middlesex Archæological Society.

porticos of the Temple of Artemis, with its sumptuous sculptured columns, Diana of the Ephesians, the great temple of Aphrodite at Corinth, and finally he had seen Rome in her magnificence, the baths and temples and triumphal arches, amphitheatres, and the Golden House of Nero, which, even now, in their ruined grandeur, strike us with awe and admiration. The holy apostles and their successors had seen all these glories of the old world, and had turned from them as things offered to idols, and would have none of them. It has been reserved for us and for our times to revive in a Christian church the portico of a temple of Bacchus, to add to its sides the caryatides of a temple to Erechtheus, and to crown it with the temple of the Winds or wingless Victory, and to decorate the exteriors of others with the skulls of oxen. Constantine removed the seat of Government from Rome, as if that city was too deeply stained with heathenism and its hideous memories, and founded at Byzantium a new Rome, known as Constantinople, and it is to these and to Asia Minor that we must look for those buildings that are purely indigenous to Christianity, rather than to Rome, where buildings would be necessarily adapted rather than originated.

We are now brought, then, face to face with these two types of architecture, at their first point of divergence, as distinct as are the two great branches of the Church Catholic, the East and the West, who adopted and developed these types; and it is to the latter that we must look for the types adopted for our architecture in England, although the East exerted no small influence on our Liturgy, and can be traced even in our architecture.

As they were contemporary, it matters little which we first consider; but as, perhaps, the Western exercised the most influence, we will take that first.

Now, among the many sumptuous buildings of ancient Rome, there is one particular class which offered to the early Christian Church certain advantages of plan and arrangement suitable to its wants, and which was also free from the pollution of heathen rites. This class of building was called a Basilica: the origin of the word was Greek, but why it was applied to these buildings no satisfactory reason can be found; it was generally used in connexion with another Greek word *Stoa*. There were several of these in Rome (two in the Forum), and were used as law courts and places for transacting general business; the most simple form was that of a long parallelogram, with one or two rows of columns on each side, and an apsidal recess sometimes only at one end, sometimes at both. This was the form adopted by the Western Church, in preference to any other, as it lent itself more easily to its requirements.

It is supposed that the name "basilica" was adopted from the Greeks at Athens, whose second archon was styled *ἄρχων βασιλεύς*, and the tribunal where he adjudicated *στοά βασίλειος*, situate in the Athenian Ceramicus, immediately beneath the Pnyx. According to Livy, it was not introduced into Rome until B.C. 182. In the centre of the apsis was seated the quæstor, or prætor, in a currule chair, with seats each side for the assessors, or judices, and in advance was the altar for libations. St. John (xix. 13) alludes to this as Gabbatha, or Lithostroton, the "pavement." The ranges of columns extending down each side of this hall were not always closed in by walls, nor was it universally roofed. No secular basilica remains now, with the exception of the one at Trèves, in use as a Christian church. The early Christians adopted the form, but not the actual building, although the same conscientious reasons which deterred them from adopting the temples could not apply.

The Pantheon at Rome is the only exception to this rule as to heathen temples. It was not originally a temple, but the hall of some large baths built by Agrippa, although undoubtedly afterwards used as a temple, and a portico added. When first used for a Christian church is uncertain,—probably not in the first ages of Christianity.

To assimilate the basilican plan for Christian requirements certain modifications had to be made to meet them, and they were carried out in the following manner. First, the three orders of the clergy had to be provided for, bishops, priests, and deacons; next, the general body of the faithful, men and women; and, lastly, the catechumens, or those who had not been received into the full fellowship of the church.

In the apse, or semicircular projection at one end, usually the west, was seated the bishop, and on each side of him the presbyters or priests, facing east in front of them, a little in advance of the chord of the apse, was the altar; between the altar and the body of the church, was the place for the inferior clergy or deacons, where the ordinary services, other than that of the Eucharist, were conducted; then came the congregation, the men on the south side, the women on the north. If the church possessed a narthex, or pronaos, the catechumens and penitents were located there. This narthex was an outer court, or portico, with three doors of entrance into the church; if this architectural arrangement did not exist, a curtain or veil separated the catechumens from the general body.

In celebrating the Eucharist the bishop or priest stood on that side of the altar, with his face towards the congregation and looking east, a position which for eighteen centuries has never varied, while the position of the congregation has been exactly reversed. At St. Peter's, the Pope, when he celebrates at the high altar under the dome, does precisely the same as his predecessors fifteen centuries ago.

In the East, where the basilican plan, although used, was not, from various causes, universally adopted, perhaps from liturgical reasons, most probably from that freedom which the great metropolis of the Christian world, Constantinople, wished to assume in the matter of architecture, desiring rather to found a style entirely free from the taint of Paganism than adopt one associated with it, however remotely; but Constantine did not entirely dispense with the basilican arrangement.

The main feature of this style introduced by Constantine was covering vast spaces by one huge vault or dome, out of which opened lesser half domes, and in the Church of St. Sergius, at Constantinople, and again in that ancient cathedral of the Christian world, the Church of the Holy Wisdom or Santa Sophia, now alas! in the hands of the unbelieving Mahometan, to the scandal of Christendom. This feature of vaulting is carried out almost to an excess. At Ravenna, in the Church of San Vitale, we find a similar complex arrangement of vaults, but the most usual and most simple plan adopted by the Eastern Church was that of a Greek cross of four equal arms, with a dome at the intersection, often square-ended, and sometimes triapsidal, that is, having three apses or semicircular recesses at the east end. Unlike the Western in this particular, the divine mysteries were celebrated behind a solid stone screen, pierced with three doors, the centre being the largest and widest, and provided with curtains. The altar, or, as the Greeks call it, the throne, stands in advance of the apse, but during the prayer of consecration the doors of the screen or "iconostasis" are closed, and the veil drawn. The space behind the screen is called the *ἅγιον βῆμα*, and the term "altar" is applied not to the actual altar, but to the whole of the space behind the screen. The arrangement of the seats for the bishop or patriarch, and priests or elders, was the same as in the West; on the left of the central apse was a smaller one, containing the table of the Prothesis, answering to our credence. On the right hand a similar apse was termed the Diaconicum, and corresponded to a vestry or sacristy. In front of the iconostasis was a space railed off for the singers and lesser clergy; beyond were the congregation, and, like the Western church, provision was always made for the catechumens by a narthex or pronaos.

In these two leading types, both of which have survived to this day, and are in common use, one can trace the influence exercised by the ancient liturgies, and it is natural that in the East, where necessarily the use of the liturgy of St. Mark, or St. James, the first bishop of Jerusalem, and other ancient liturgies, such as those of SS. Basil and Chrysostom, would be general, certain traditions of the Temple at Jerusalem, with its veil and holy of holies, would slightly influence the ritual arrangements.

In the foregoing remarks, it has only been possible to summarise, as it were, the two leading types of church architecture; much has been necessarily left out, especially the descriptions of ancient churches and their contents as described by Eusebius and others; but those who are curious on this point cannot do better than consult that before-mentioned great father of ecclesiastical history.

The second head or division on which we must now dwell is, "How far, and to what extent, these types of the visible Christian Church as a fabric existed here in England and in the sister isle?"

The old tradition that Christianity was first brought here by the patron saint of our own cathedral, that great apostle of the Gentiles, St. Paul, and St. Joseph of Arimathea, is one which, however one would like to believe it, requires a little more evidence before it can be taken implicitly.

Christianity was preached here at a very early period, there can be little doubt, but whether its introduction was due to apostolic labours, or whether it was introduced by missionaries from Gaul subsequently to the time of the apostles, the most probable conclusion, need not detain us now.

That our own city of London was, even in those days, no mean or contemptible city we have the authority of Tacitus, "Londinium, copia negotiatorum et commeatu maxime celeberrimum." (London, famous for its many merchants, and the abundance of its provisions.) But Eusebius states that at the council held at Arles, A.D. 314 (Hist. Eccl., lib. x. cap. v.), Eborius, bishop of York, which, with all due deference, to Eusebius, must mean, not the name of the man, but that of his see, "Ebor," or Eboracensis, Restituus, bishop of London, and Adelphius, bishop of Caerleon, were all present, that fact alone showing that Christianity was so far universal that even in those early times London was possessed of a cathedral, and that the whole country was mapped out for ecclesiastical purposes, and they were also summoned to attend at Nice, 325; Sardis, 347; and Arminium, 359. There is something glorious in the idea that a bishop of London was one of those who drew up that mighty confession of faith, the Nicene Creed.

St. Helena, the Empress-mother of Constantine, generally supposed to have been a British princess, doubtless favoured the land of her birth, and the Roman city of London probably possessed several churches other than the cathedral, but the utter ruin which fell upon London after the withdrawal of the Romans, and the long struggles with the Picts and Scots, and afterwards with the Saxon hordes, ended in the total expulsion of its Christian inhabitants. Theonus, archbishop of London, and Theodicus, archbishop of York, fled with their clergy and people into the wilds of Wales and Cornwall, to the shores and rocky coasts of Brittany, and to Ireland.

But we have some traditions here in London not to be utterly ignored. St. Peter's-upon-Cornhill sets up a claim for remote antiquity; and again with regard to St. Helen's, Bishopsgate, what could have been more natural but that the early Christians of this city should have dedicated a church to her to whom they owed so much? That portion of London, then outside the limits of the Roman city, was a very wealthy quarter, as the numerous remains of tesselated pavements of villa residences show. And why, lastly, was our cathedral church dedicated to St. Paul,—a very rare dedication? These questions are very suggestive, and they all point to a very remote and early period of Christianity, some centuries before St. Augustine and his monks ever reached these shores. But whatever this primitive type of church architecture and arrangement was, the succeeding two centuries of Paganism, when the worship of Wodin, Thor, and Friga replaced Christianity for the time, had so utterly obliterated it that at the advent of St. Augustine it existed almost in tradition only. Ireland, whither St. Patrick had fled,—for the patron saint of the Emerald Isle was himself a Briton,—has preserved some very ancient stone structures dating from these times. The plan of these is generally a parallelogram, divided into two portions by an arch; but the workmanship is so rude that it is probably the reason why so simple a plan was adopted, and one which could easily be built by rude and inexperienced workmen.

Wales possesses a great number of very small churches, consisting of only nave and chancel, almost invariably square-ended. In Cornwall, although showing traces of the early Church, especially in the curious dedications to saints of essentially British origin, the churches have nearly all been rebuilt in later times.

Brittany, again, another place of refuge for the early Christians, although full of monuments of an age still more remote,—the megalithic,—has nothing that can positively be identified. Perhaps Lanleff may be; if so, it is an excep-

tion to the rule, being circular. Some excavations at the Reculvers brought to light the plan of an exceedingly early church; but this, from its position in the midst of a castrum, would probably be Roman, and the same may be said of the church of St. Mary, in Dover Castle, and of another ancient church at South Elmham, near Bungay, and again another at Castle Rising,—all these are within the precincts of Roman prætorian camps. The Reculvers had been considerably altered before it was purposely ruined in the last century, but there is sufficient left to show what the original plan was before the additions in the twelfth and thirteenth centuries.

The basilican type is so apparent that some antiquaries would have us believe that it was a basilica and not a Christian church. It has a nave, divided from north and south aisles, not by columns, but by piers or portions of the wall; dividing the nave from the chancel were three lofty arches, the centre being the highest, carried on two detached columns. The chancel is apsidal, with two small openings or doors communicating with chambers at the eastern end of each aisle, corresponding to the prothesis and diaconicum of a Greek church, and the whole floor is a bed of solid concrete. At Elmham there are no aisles, but the nave was crossed at the distance of 27 ft. from the west by a solid partition, pierced by two narrow lofty arches and a central pier, the pronaos or narthex of the Greek church. At Castle Rising the plan consists of a nave, 41 ft. by 19 ft.; then a narrow arch, only 9 ft. wide, leading into a chancel, 13 ft. square; then another arch, 9 ft. wide, opening into an apsidal recess, 15 ft. by 32 ft. 9 in.

On the authority of the Venerable Bede, St. Augustine was advised by St. Gregory not to destroy the heathen temples of the English, but only to remove the images of their gods, to wash the walls with holy water, to erect altars, and deposit relics in them, and convert them into Christian churches, not only to save the expense of building new ones, but also that the people might be more easily prevailed on to frequent those places of worship to which they had been accustomed.

A.D. 602.

From this period we do possess authentic records of ecclesiastical architecture.

St. Augustine, on his arrival at Canterbury, found one ancient church in use,—that of St. Martin, for Bertha, the queen of Ethelbert, was a Christian, and another one in ruins, destined to become the venerable mother church of every one in England, and the seat of the metropolitan archbishops of Canterbury.

This church, as rebuilt by St. Augustine, who was so conversant with the basilica of St. Peter's at Rome, would naturally present similar features, and accordingly we find, from the account given of it by Eadmer, that it was a basilica; but, with one or two unusual features. It possessed both an eastern and a western apse; the eastern one contained the high altar, and the western, the altar of St. Mary. It further possessed two towers,—one dedicated to St. Gregory on the south side, through which was an entrance into the church, and another on the north dedicated to St. Martin; these towers were about in the centre of each side. It still further carried out the basilican tradition in possessing a crypt; and the bodies of SS. Wilfrid of York and Swithin of Winchester were placed under the altars; and the patriarchal chair in the western apse behind the altar, so that the priest celebrating mass at the altar of St. Mary had his face to the congregation. Of course, when the celebration took place at the other altar in the eastern apse the positions were reversed, a change which has since become universal, and which very probably dates from this proto-cathedral.

Such was the first cathedral of Canterbury, a building likely to exert an immense influence on all other churches of the converted Saxons throughout England, and to be adopted as a type, and in such manner did it exist until 1067, when it was totally burnt by fire.

The cathedral church of St. Peter at Winchester dates from a period even more remote than that of Canterbury. Lucius, king of the Britons, a personage whom some consider purely mythical, although constant reference is made to him in very ancient records, founded it A.D. 164, and dedicated it to our Saviour A.D. 169; from the authority of Moracius, an historian whose works are now lost, we have a circumstantial account of its size, two Pagan temples are spoken of as being in close proximity—Concord and Apollo. The city was then called Kaergwent, afterwards Winton or Winchester. This church was totally destroyed during the persecution under Diocletian, but was rebuilt A.D. 293, and rededicated to St. Amphibalus, but on a smaller scale. It fell under the power of the Saxons, and for the period of 142 years was a heathen temple. St. Birinus, who converted this part of England forty-one years after St. Augustine, was instrumental in getting it rebuilt and rededicated (for the third time) in honour of the Holy Trinity.

St. Swithin, who died A.D. 863, was interred, according to his own injunctions, outside this church, and Wolstan in his life of him says that a tower, capped with a roof, and of the greatest magnitude, stood before the lovely entrance of the holy temple; between this and the sacred nave the body of the saint was interred, for he thought himself unworthy of being buried within the church. But it was again rebuilt and rededicated to the holy apostles St. Peter and St. Paul, by Athelwold, consecrated bishop A.D. 963. This bishop was a great builder of churches. Ely and Medeamstede, afterwards called Peterborough, and Thorney, all experienced his benefactions. Wolstan gives a poetical description of this church and of its dedication in A.D. 980, which will give a fair idea of its magnificence; and yet scarcely a century had passed when it was once more destroyed, and the present one erected by the side of it, by Bishop Walkelin. York, Worcester, and St. Paul's have similar histories attached to them of buildings and rebuildings, and these instances are given to show that architecture in Saxon England was anything but a stationary art, and that these churches were built of stone, and possessed aisles and chapels, triforia and clearstories, and central and other towers, and that the only reason why in these days we cannot absolutely fix upon any portion of our bigger minsters as being Saxon is that each age pulled down the work of the preceding one, only to replace it with something better; but, to dismiss Saxon architecture altogether, and to argue that it never existed, and that the buildings were of the rudest description, and generally built of wood, as some authorities do, is a manifest absurdity and a wilful shutting of one's eyes to documentary evidence so clear and so precise. Thus what can be clearer than the following description of the cathedral at York, given by Flaccus Alcuinus?

But a new structure of a wondrous basilica was in the days of this bishop (Egbert) begun, completed, and consecrated. The house, of appropriate altitude, is supported by solid columns set under curved arches. Within it sparkles with admirable ceilings and windows, and in its beauty shines environed with many aisles (or apsidal chapels). It has a great number of apartments with distinct roofs, which contain thirty altars, with various ornaments. Two disciples, Eanbald and Alcuin, at the command of the prelate, erected this temple, and he himself consecrated it to the "Alma Sophia" ten days before his death.

It has been observed that the plan adopted by the Anglo-Saxons was invariably the basilican; but certain modifications began to be apparent, both in the structional plan and in the ritual arrangements. The growth of monasticism had a good deal to do with this: the necessity of a long choir, to accommodate a number of monks, and the consequent seclusion of their altar, their part of the church being screened off, necessitated the provision of an altar for the laity, either outside the screen or in some chapel especially set aside for that purpose. The cross was very strongly marked in the ground plans. The projection of the transepts brought this into greater prominence, but these changes only affected the large cathedral churches and monasteries; the smaller parish churches were still constructed on a modified form of the basilican type, with or without aisles.

At Brixworth we have the remains of a Saxon church, now considerably reduced and modified, founded by Saxulphus as a cell to Medampstede (Peterborough), *circa* A.D. 700. The plan consisted of a nave of four bays, with north and south aisles, a choir with two short aisles only half its length, and a semicircular presbytery beyond. The arches are quite plain, and are supported by square piers, or rather portions of the wall, for the pier is of the same size as the opening; the aisles have been destroyed, but the foundations yet remain; they opened into square chambers at each end, communicating with the western tower and the choir; an arch separated the nave from the choir, and the choir from the presbytery, and a similar arch existed at the west end, opening into the tower. It very much resembles the church of the Reculvers. Roman brick is extensively used in both these churches. The similarity between the two buildings is so striking that we must either reject the Reculvers as being Roman, or Brixworth as being Saxon, and the evidence being so strongly in favour of the former, it is most probable that the foundation by Saxulphus was only a refoundation.

Scattered throughout England are certain other architectural remains to be found in about 120 churches; these remains are supposed to be Saxon, and they generally consist of rude balusters, shafts, angular straight-sided arches, flat strip-like pilasters, corner stones alternately long and short, masonry disposed in what is called herring-bone fashion, and doorways with plain stone semicircular arches, without any mouldings or enrichments whatever. Sompting, Barnack, Deerhurst, Earl's Barton, and S. Benet, Cambridge, are all in this style, or show decided traces.

But we have a remarkable corroboration of the richness of these Saxon buildings in many of the beautiful illuminated manuscripts of the same period. They represent very often buildings showing all the characteristics of a style called now Norman. Take as an instance the "Benedictional of St. Ethelwold" now in the possession of the Duke of Devonshire, and in these gorgeous pages we find in the borders and in the miniatures columns and capitals of which we can easily find the prototypes.

This book had been ordered by St. Ethelwold of a certain monk subject to him, one Godemann, and in a part of the metrical dedication occurs this passage:—"He ordered also to be made in it many arches elegantly decorated and fitted up with various ornamental pictures expressed in divers beautiful colours and gold." Ethelwold, or Athelwold, has been referred to in the history of Winchester Cathedral as a rebuilder of that and also of Peterborough, Ely, and Thorney, and the date of this book must therefore be between the years 963 and 984; and on the last page is represented a bishop,—probably St. Ethelwold, or his predecessor, St. Swithin,—giving the benediction, and at the top some architectural details, especially a very graceful bell-tower, surmounted by a weathercock, showing the bells; and Wolstan, whose poem has been already referred to, thus speaks of this very tower:—"A sparkling tower, which reflects from heaven the first rays of the rising sun. It has five compartments, pierced by open windows, and on all four sides as many ways are open. The lofty peaks of the tower are capped with pointed roofs. Above these stands a rod with golden balls, and at the top a mighty golden cock, which boldly turns its face to every wind that blows."

But we now approach a period always looked upon as a turning point in our history, that is the so-called Conquest by William, Duke of Normandy,—no more a conquest than that of another William, of Dutch extraction, at a later period of our history; and according to almost universal authority, we are called upon to believe that in a short period of about fifty years every ecclesiastical building in the kingdom was either wholly or partially rebuilt, and that the architecture of Saxon England was entirely destroyed; thus disposing of all the great cathedrals, and equally great abbeys, and some thousands of parish churches. It might have been so, but does it seem likely? Was the state of society sufficiently tranquil to allow of this? or sufficiently wealthy to afford it? Let others answer this as they can, but the impression must remain upon the mind of all who consider this question, that in nine cases out of ten these pompous and eulogistic descriptions of the universal rebuildings by Norman bishops and abbots were nothing more than recasings or remodellings of existing structures, and that we still possess in most of them the shell or carcass of the original Saxon work overlaid with later enrichments and embellishments.

A.D. 1066 to 1100.

No modification whatever of the existing plan adopted by the Saxons, that is the basilican, with transepts, and aisles, and apses, with surrounding aisles and chapels for the larger churches, and naves, with or without aisles and chancels and western tower for the

ordinary parish churches, took place on the change of dynasty; but there was one feature which soon became universal, namely, vaulting after the Roman manner, that is, without diagonal ribs, at first only over the aisles and chapels, the main roof being still of timber, according to the old basilican tradition. The principle of this vaulting was that of two barrel-vaults intersecting one another at right angles, a principle known and practised long before by the Romans. The semicircular arch is universal; the capitals of the pillars are of that character called cushioned cap; the bases are plain, generally only of one member; ornament is at first sparingly introduced, although as the century approaches the end it becomes redundant, giving to the so-called Norman style a richness scarcely equalled, and never exceeded, by the successive styles. The piers, which were before nothing more than one or two plain orders in the arches carried down to the ground, and separated from them by plain chamfered strings, become now pillars, the arches of the triforia, instead of being of one opening, now having two or more arches grouped under one containing arch; and the clearstory, instead of having one window perfectly plain and only splayed internally, is enriched now in the inside by being placed in a sort of triple arcade; a greater use is made of wrought stonework, the rough walling now being universally ashlared,—that is, covered with a casing of wrought stone blocks. The larger churches are generally adorned with three towers, sometimes more, and are surmounted by high pyramidal roofs covered with lead. The external doorways now become of several orders, each differently and highly enriched. Figure sculpture of a rude and archaic character, interspersed with gryphons and dragons and rude foliage, now adorns the capitals; and, lastly, two very characteristic enrichments, the chevron or zigzag and the billet. The walls are always of an enormous thickness, and the buttresses are of only a very slight projection.

In the small parish churches the chancel arch, which is often very narrow, has sometimes two smaller arches on each side, and, following a primitive tradition, the chancels are generally square-ended. This square end is undoubtedly an ancient British custom, perhaps one of those traditionary rules derived from the Eastern Church before Roman colonists or missionaries introduced the apse, and in the low chancel arch, and the two others, as at Barfreston, there may be just a faint reminiscence of the iconostasis and its triple doors.

Kilpeck, and one or two other churches in the county of Hereford, have this peculiarity of plan, a square chancel, and a second arch opening into an apsidal recess, resembling the churches at Brixworth and South Elmham. In the great churches at Caen in Normandy, built by Duke William and his consort Matilda, called respectively the Abbaye aux Hommes and the Abbaye aux Dames, we might have had a good opportunity of comparing these buildings with the work at Winchester, St. Alban's, and Rochester, but these Normandy examples have unfortunately undergone some very material changes since their first erection, and recent researches now prove that very little remains of the originals,—the twelfth century having remodelled them. The addition of the vaulting also has entirely changed their appearance, for the original roofs were of timber. In the chapel of St. John, in the White Tower, we shall find a very early and very pure specimen of Norman architecture, and again, in the substructure of the dormitory at Westminster Abbey, some early Norman work, the latter being very similar to the transepts at Winchester. These two examples we shall hope to have the pleasure of seeing on Saturday next, our first field-day, when a personal inspection will give you all a better idea of the characteristics of the style than the mere dry description given here.

No attempt has been made in this paper to enter into the subject of symbolism, and how far it influenced Christian architecture, neither has the subject of the decoration of these buildings been touched upon; both are subjects to which your attention will be hereafter directed; but from this point at which we have arrived carry your mind back through the thousand years which have elapsed from our starting-point, and mark how carefully primitive tradition has been handed down from age to age. The outer forms and architectural ornament may have changed and varied, the constructive skill may have improved as the principle of the arch became better understood and better applied; the pure Pagan style of ancient Rome, with its columns and horizontal entablatures, gradually develop into a pure Christian style under Constantine; then the partial eclipse of art during those dark ages, only to shine forth again under Charlemagne, in Western Europe, and under St. Wilfrid here in Saxon England; and yet how little have all these changes influenced the plan of the fabric, for in the Saxon and Norman cathedral or church we can still trace the arrangement of the early basilica, with its colonnaded aisles and semicircular apse and wooden roofs. In the bigger minsters the cross may affect the plan, but does not materially alter it; the sober dignity of the upper chamber, the best room, is imparted to the church, the best building in the town or village; the solemn gloom of the oratory in the catacombs is reproduced in the vaulted crypts, and beneath the altars still repose the bodies of the saints. The atrium and the cloister are identical. The narthex can be traced in the galilees of Durham, Glastonbury (and Ely in a modified form), and in the porches of the smaller parish churches. The Christian altar is still the centre of worship, and where its highest acts are performed, and the apostolic doctrine perpetuated.

Christianity has stamped its seal upon this early architecture. These venerable churches could never be anything else but temples of the Lord. The stern and massive grandeur of a Norman cathedral or church strikes one as the very embodiment of the Christian faith founded on a rock. Her foundations are upon the holy hills:—

> "That upper room is Heaven on earth;
> Within its precincts lie
> All that earth has of faith or hope,
> Or Heaven-born charity.
> Those tongues still speak within the church,
> That fire is undecay'd;
> Its well-spring was that upper room,
> Where those twelve princes pray'd."

ELECTRIC LIGHT APPARATUS AT THE ALBERT HALL.

UNDOUBTEDLY the most complete exhibition of the capabilities of the several varieties of the electric light which has yet taken place in any part of the world is the one which, formally inaugurated on Wednesday evening last, in the presence of H.R.H. the Prince of Wales, H.R.H. the Duke of Edinburgh, H.R.H. Prince Christian, H.S.H. the Duke of Teck, and in the midst of a large and brilliant (in more senses than one) assemblage, will remain open until this (Saturday) evening. It was a happy idea on the part of the Council of the Royal Albert Hall to practically apply the electric light to the illumination of that unique building, and, as the Duke of Edinburgh observed at the close of the meeting, the Council should receive the thanks of the public and of the seatholders for their enterprise in the matter. The idea of holding a comprehensive exhibition of the powers of the electric light seems to have naturally ensued, and the suitability of the hall for such a display as that witnessed on Wednesday evening was apparent to all who were present. In and around the arena were fixed a number of lamps for exhibiting the different varieties of the electric light now before the world. Other apparatus of the most diverse kind, but all having some relation to the subject of lighting, was exhibited on benches placed between the various groups of lights, and in each opening of the arcade of the upper gallery was placed a Jablochkoff light. As Mr. Preece proceeded with his lecture the several kinds of light were in turn exhibited, generally without any hitch or *contretemps* whatever. The marvel is that with such a complication of wires, machines, lamps, and engines, everything went so smoothly. The labour of getting the materials together must have been very onerous, and the Council of the Royal Albert Hall owe much to the co-operation of the Society of Telegraph Engineers.

We cannot better introduce the subject than in the words prefixed to the programme by Mr. J. N. Shoolbred, C.E., who has materially assisted Mr. Wentworth Cole, the manager, in the arrangement,—no slight job,—of the various engines and machines:—

"The council, in this collection of apparatus in connexion with Electric Lighting, have endeavoured to make it embrace the entire scope of all applications into which electric light strictly enters; and likewise as completely representative as possible of all the various means hitherto devised for the production of the electric light by mechanical means. There will, consequently, be found among the exhibits apparatus superseded by modern improvements. They will, nevertheless, be of interest, in showing the steps which have led gradually to the present, more or less perfected, inventions. It was not until the electric current was obtainable by mechanical means that the use of the light from it became at all general; its production from the voltaic battery, owing to its costliness and the care required, having confined its use to the lecture theatre and to a few other applications. The introduction of the greatly-improved methods now employed for the production of electricity by mechanical means, is due to the development of Faraday's discovery, in 1831, that an electric-spark could be obtained by causing a soft-iron bar, or core, having a coil of copper wire wound upon it, to approach and recede from the poles of a permanent magnet. This discovery, small though it seems, is the germ which, developed by the hand-worked machines of Pixii, of Saxton, of Wilde, and others (some of which are in the present collection), led up to the large electric machines of Nollet, driven by a steam-engine. From these machines it was that, after certain modifications, Professor Holmes, in 1853, in Paris, first produced in a practical form a continuous and steady stream of electric light. Amongst the exhibits are some of the types of machines by means of which this inventor introduced, in 1859, this brilliant luminary into our lighthouses; to be closely followed by the Alliance Company of Paris with those on the French coasts. In 1867 the discovery, made simultaneously by Sir Charles Wheatstone and by Dr. W. Siemens, of the principle of augmentation of electric currents by the reaction of electro-magnets upon one another, added another class of electric machines to those already known; since the further necessity for permanent magnets was thereby dispensed with; as the action of two electro-magnets upon each other, it was found, by commencing with the very feeble magnetism always latent in the iron-core, gradually intensified the electric current produced, a portion of it being passed backwards and forwards through the respective cores until it became of very considerable power. These machines, using electro-magnets only in their construction, are termed 'dynamo-electric,' in distinction to the earlier ones, where permanent magnets of steel are used, and to which the term 'magneto-electric' is applied. From this date the successive machines of Ladd, of Siemens, of Gramme, and of others, all for single lights, followed in quick succession, while about 1875 Lontin, and, later on, Gramme, devised machines suitable for the production of many lights. It is from the last-named that the well-known Jablochkoff candles are usually supplied; while the former is distinguished by the method which bears the inventor's name. All of the systems of lighting just referred to, as well as the Wilde and the Wallace-Farmer, will be seen in operation in the interior of the hall, and the first-named also round a portion of the corridors; while certain parts of the exterior of the building, and of the adjoining spaces, will be illuminated by the concentrated rays emanating from a Gramme machine, and projected by a reflector attached to a Serrin lamp. Most of the best-known forms of lamps, wherewith the electric-light is produced, are included in the collection; which also contains, besides, samples of carbons, conducting-wires, and other smaller appliances, examples of photometers, and of other instruments for measuring the intensity of the light produced; or, in some cases, of the electric current itself."

The space at our disposal will not allow us to give at this time any detailed description of the exhibits, several of which have, indeed, been previously described in our volumes. It may be of interest, however, to state that the collection includes the following:—

WORKING EXHIBITS.

West Arena Entrance.—Otto gas engine, 8-h.p. driving, exhibited by Crossley Bros.; electric machine 2 Gramme "A," by British Electric Light Co.

East Arena, Covered Entrance.—Two Marshall's portable steam engines, driving four Gramme "A" machines, lighting approach to Hall, by India Rubber, &c., Co.; one Wallis and Steevens portable steam-engine, driving Wallace-Farmer machine, by Anglo-American Electric Light Co.; Gramme "D" with "Brotherhood" three-cylinder engine, complete on frame, by the War Office.

Engine-room: Electric Machines.—Siemens single light, by Siemens Bros.; Gramme multiple light, by the Société Générale d'Electricité; Lontin multiple light, by G. P. Harding; Wilde multiple light, by the Electric Lighting Co.

In *Arena of Hall* are the following working exhibits:—*Electric Lights.*—Siemens, by Siemens Bros.; Serrin, Werdermann, Reynier, and Higgins, by British Electric Light Company; Rapieff, by National Electric Light Corporation; Wallace, by Anglo-American Electric Light Company; Iridium incandescent light, by Anglo-American Electric Light Company; Jablochkoff, by Société Générale d'Electricité; De Meritens, by Edmundson & Co.; Wilde, by the Electric Lighting Co.

ILLUSTRATIVE EXHIBITS IN ARENA OF HALL.

Otto gas-engine, 3½ h.p. driving, by Crossley Bros.
Gramme machine and Werdermann lamp.

Electric Machines:—Saxton, by Royal Institution; Holmes (original magneto-electric machine), by Trinity House; Alliance Co. (magneto-electric machine), by Trinity House; Holmes (original dynamo-electric machine), by Trinity House; Gramme (magneto), by Ladd; Gramme dynamo "M" size, by India Rubber and Gutta Percha Co.; Wilde's magneto, by Royal Institution; Siemens (original dynamo-machine, shown before Royal Society), by Siemens; Ladd (double armature) dynamo, by Ladd; Siemens (single-light) dynamo, by Siemens Bros.; Siemens (dividing-light) dynamo, by Siemens Bros.; Gramme (quantity-working Werdermann) dynamo, by British Electric Light Co.; Gramme (dividing-light), by Edmundson & Co.; De Meritens (small machine) magneto, by De Meritens; Schuckert dynamo, by B. Brain; Wallace-Farmer, by Anglo-American Electric Light Company; Tisley's dynamo-electric, by S. C. Tisley & Co.; Wilde's electro-magnetic inductine, by The Electric Lighting Company.

Electric Lamps.—Regulators: Siemens (small size and lighthouse), by Siemens Bros.; Dubosco, by Trinity House; Holmes (original and improved), by Trinity House; Chapman, by H. Chapman; Serrin and Suisse (Hallé), by the British Electric Light Company; Serrin-Suisse (*a* ordinary form, *b* for sixteen hours burning, *c* large marine size), by F. Suisse; Rapieff (four and three-carbon forms and "Moderator"), by the National Electric Light Corporation; Serrin-Lontin, de Mersanne, by G. P. Harding; Wallace, Jasper, and others, by the Anglo-American Electric Light Company; Hand and inclined of different kinds, by the War Office; Krupp, by B. Brain; Pyramid, by B. Brain; and De Fonvielle, by W. de Fonvielle.—Candles: Jablochkoff, by the Société Générale d'Electricité; Wilde, by the Electric Lighting Company; De Meritens, by De Meritens; Rapieff, by the National Electric Light Corporation; and André, by G. G. André.—Incandescent Lamps: Reynier, by W. Crooks; Werdermann, by the British Electric Light Company; Higgins, by Leslie C. Hill; Iridium light, by the Anglo-American Electric Light Company; and Mining, by G. G. André.

Carbons.—Samples of manufactures of by Carré; Sautter, Lemonier, & Co.; Siemens; India Rubber and Gutta Percha Company.

Photometric Apparatus.—Photometers, and 6-wick colza oil Trinity lamp, by Trinity House; Bunsen photometer, and 16-candle sperm-oil lamp, by T. W. Keates; Bunsen photometers, lamps, and standard sperm candles, by W. Sugg; and Wheatstone photometer, by British Electric Light Company.

Other Apparatus.—Holophote, by War Office; light-house dioptric apparatus, by Trinity House; projector, by Siemens Brothers; Harding's velocimeter, by Siemens Brothers; velocimeter, by R. Applegarth; instruments adapted to the use of the electric light in surgical operations, by G. Trouvé; hand-lamp for use in surgical operations, by B. Squire; Bracket-lamp for use in dental operations, by B. Squire; Grieve's lantern shade or theatrical "medium," by J. J. Calder; and Obach's galvanometer, by Siemens Brothers.

Conducting Wires and Cables.—Samples of different kinds used for electric lighting, by Siemens Brothers; British Electric Light Company; G. P. Harding (Lontin lights); Société Générale d'Electricité (Jablochkoff candles); and India Rubber and Gutta Percha Company.

The exhibition was formally inaugurated on Wednesday evening by a lecture by Mr. W. H. Preece.

H.R.H. the Duke of Edinburgh, in opening the proceedings, said that as senior vice-president of the Council of the Royal Albert Hall, it devolved upon him to introduce to the audience Mr. Preece, the electrician to the Post-office, who had been kind enough to consent to lecture upon electric lighting.

Mr. Preece said:—Your Royal Highness, my Lords, Ladies, and Gentlemen,—The greatest source of light that we possess on this earth is the sun; the worst is the farthing rushlight. Between these two we have various sources of artificial illumination, dependent on oil, on tallow, on gas, and on electricity. But in all these sources we are simply dependent for our light upon the production of heat. A piece of coal, as you are aware, has merely to be lighted to produce a glow; but if we, instead of leaving the combustion to be supported by the atmosphere, apply oxygen, we increase the glow through the production of increased heat. And, to give you another illustration of this, we will burn a piece of charcoal in an atmosphere of oxygen. I have here a flask full of oxygen, and we will light a piece of charcoal and introduce it into the flask, and you will see that the charcoal will burst into flame with a brilliant light dependent upon the mass of heat produced. Besides producing heat, it is very necessary to have matter in a very fine state of subdivision; and when intense heat is applied to matter of this description we increase very largely the supply of light. Here we have a small flame, and we throw upon it some lycopodium. You see at once that the application of heat to this matter in its fine state of subdivision produces intense light. The first problem that we have to solve in artificial lighting is how to produce heat. Heat can be produced by chemistry, by the production of electricity, and by various other means. Here I have the ends of two wires communicating with a machine out of doors, and when I bring the wires into contact the effect is very feeble. But they always feel the power of electricity. You will observe that somebody has come to my aid, and by simply bringing those two wires into contact we produce heat by electricity. Now if, instead of passing the current through these two wires, I pass it through a long piece of platinum wire, you will see that the wire becomes incandescent, and visible to you all. Again, if instead of passing the current through the wire I bring it across the air without making a contact between the two pieces of carbon, I produce what is called the electric arc, because in an electric arc the current bridges over a space of air, and forms there an arch of flame. Now, in order that you may see this arc in its perfect form, we will throw an enlarged image of it upon a white screen fixed against the organ. Let us go back a little in our history and start from the year 1831. In that year Faraday succeeded in producing electricity by the simple motion of wires in the neighbourhood or in the field of a magnet, and through the kindness of the Royal Institution we have to-night on the table in front of me the very apparatus itself by which Faraday succeeded in attracting the spark from the magnet. Mr. Ladd will now turn that small machine very rapidly; and in doing so he has converted the muscular energy of his arm into currents of electricity which produce heat and light. But man is not strong enough to afford the power to produce such currents as will give us the electric light; we must call in either steam or gas or some other motive power; and in order that you may see all these operations, we have in the arena Mr. Crossley's gas-engine, which we will now start, and it will work a small Gramme machine. The Gramme machine is now at work, and the currents produced by it are conducted to yonder lamp, and there produce the electric arc, giving intense heat and light. All these operations will be more evident to you when you have the opportunity of inspecting the machinery at the close. Electric lighting by incandescence is illustrated by the lamp of Mr. Werdermann. There you have five pretty little lights produced by this principle of incandescence; and at this table we will produce a light by incandescence by rendering that very rare metal, iridium, incandescent. We have in this globe a piece of iridium, about 3 in. long. Passing through it a powerful current of electricity we produce a soft and pretty light. We will also show this metal rendered incandescent in the port and starboard [red and green] bow lights before you, showing how the electric light can be applied to nautical purposes. The lights, as you will see, are far more intense than those usually employed, and have the advantage of being more durable, for iridium possesses the great advantage of not being destroyed by the heat produced. The next lamps to which I will call your attention are those which are dependent for their light upon the principle of the electric arc. Here we have the Lontin lamp, illuminated by currents produced from a machine placed outside the building. I will also call your attention to the Wallace light, which is also dependent upon the arc. This light was the one experimentally tried in the Liverpool-street Station of the Great Eastern Railway, and it has one peculiarity that makes it different from the other lights, and that is, that it will last for a week. The other lights, as a rule, will only last for a few hours. Another light that I will call your attention to is the Rapieff light, which is that used in the *Times* office. It is a remarkably constant light; as a rule, it behaves itself well, but to-night it is rather dilatory. Now it has burst into flame, and you will see what a pretty light it produces. In the *Times* office there are six of these lights, which distribute over the office a very fine bright, clear, and steady light. The next lights to which I will call attention are those called "candles," from the fact that they burn down like a candle. You are well acquainted with this kind of light from what you have seen in Paris, and, in London, on the Thames Embankment and the Holborn Viaduct. I will first direct your attention to the form of "candle" which has been produced by Mr. Wilde. The Wilde light is in these six white globes to my left, and the Jablochkoff light is in the gallery. The use of the electric "candle" admits of one problem being solved to a certain extent, and that is, it allows us to distribute the light; but then the distribution of the electric light means considerable waste. So great is this waste that the light is reduced as much as from 1,500 or 2,000 candle-power down to 200, or less. The practice of measuring light by candle-power is illustrated in the centre of the hall by photometers, which are kindly exhibited by the Metropolitan Board of Works, Mr. Sugg, and others. In fact, there is a very large quantity of apparatus exhibited here to which I cannot refer, but it will be found enumerated in the programme which has been printed. [At this point, a little delay occurred in the illumination of the Jablochkoff lights in the gallery, owing to some misunderstanding in signalling instructions. Mr. Preece therefore gave directions to turn on the Wallace light, which was controlled from the orchestra end of the arena, and in which, as Mr. Preece remarked, they had a friend upon whom they could rely in their difficulties.] It is (continued the lecturer) one of the misfortunes that always happen at lectures on the electric light that it generally plays one false; but such temporary failures are simply due to over-zeal. We will now show you the electric arc in another form,—that of Siemens's holophote lamp, which concentrates the powerful light of the lamp upon a fixed spot. This lamp is eminently calculated for use in lighthouses; and in fortifications, and on board ships, it will be of advantage in illuminating land or sea, and in enabling a watch to be kept against the approach of an enemy. It is going to be used in the Spithead Forts, to illuminate the sea with the view of preventing the approach of torpedo boats. The holophote, as you will see, may be turned round on a pivot, so as to bring its light to bear in any direction. Now, having shown you the different forms of the electric light, I will direct your attention to its practical application in the lighting of this hall. In the engine-room belonging to this establishment the engines used for pumping water and other purposes are utilised to rotate five Siemens machines, specimens of which are exhibited in the arena. These machines produce the powerful currents which illuminate the five large lamps in the roof. It is a question among physicists as to whether electric lighting by the arc or by incandescence is to be the light of the future. The light produced by the arc has been shown by Professor Tyndall to give 2½ times the amount of light given by incandescence; but there are reasons to think that much will arise from the experiments that are being made in the production of light by incandescence. The latter light has many advantages. In the first place, it is extremely steady; in the next place, it is very durable; and, lastly, if chemists can only succeed in producing a metal or material which can be raised to a very high temperature, say 5,000°, without fusion, the question is solved. Up to the present time only one substance is known which will fulfil that condition, and that is the metal iridium, which is very rare and very expensive. Another point to be referred to in connexion with the electric light is, that it is possible to have too much of a good thing. If, for instance, the electric light be used to illuminate a street, and the light afforded at the extreme end of the street be sufficient, the light at the "home" end of the street,—*i.e.*, in immediate propinquity to the light,—must be greatly in excess of the requirements at that end, and therefore there must be waste. Again, theory as well as experiment has shown that to economise your light you must centralise it; you must make one machine operate upon one light, and by that means secure as much as you can of the energy of the machine. But in the most perfect form of light you can only secure less than 50 per cent. of the energy put into the machine, and therefore to distribute this wasted energy is to cause still further waste. There are many defects in the electric light so far as we are acquainted with it. It throws intense shadows; it is flickering and unsteady; it occasionally, at most awkward moments, hisses,—a circumstance very disturbing indeed to singers, especially when they are on the high notes; it is also, in its present form, not durable. But, on the other hand, it has many advantages. It is very brilliant. If this large hall were to be properly lighted it would require fifty Jablochkoff candles, but with only half that number you see what a good light is produced. Again, the electric light produces no smoke, no noxious vapours. It rids a room or a hall of the vitiated atmosphere caused by the burning of gas; and

when you remember that in one hour every person vitiates 3,000 cubic feet of air, and that in the same time every gas-jet vitiates 9,000 cubic feet of air, you can easily understand what a benefit to health the introduction of the electric light would be. Again, the electric light clears the atmosphere of one great source of trouble in regard to sound. Professor Tyndall has shown that layers of heated air act as screens or curtains, and prevent sound from being transmitted from place to place. In each of our opera-houses and theatres we have a row of footlights in front of the stage, throwing up between the singers or actors and the audience a volume of heated air, which prevents the passage of much of the sound. Clear away those jets of gas, and use electricity, and you at once improve the acoustic properties of the theatre. All practical applications of physical science pass through three stages. First, there is the theoretical stage, when it is the dream of the philosopher. Next we have the tentative stage, when it is the dream of the capitalist. Thirdly, we have the practical stage, when the practical man takes the matter in hand, and realises the dream of the capitalist. At present the electric light is in its tentative stage. It has been tried here, it has been tried there. It is "no chicken"; it is as old as the century. It was brought into existence at the same time as gas and steam, yet gas and steam are giants, while the electric light remains a mere stripling. But there can be no doubt that the results of the experiments that are being made must lead to its further extension. It is already practically applied in one department, that is, in the illumination of lighthouses. The Trinity Board of this country have, with an enterprise which is highly creditable to them, seized upon this electric light and applied it to several important lighthouses. Other countries are following our example, in this respect. Again, it has been used largely for naval purposes. Some thirteen or fourteen of our ships are equipped with the electric light, and the War Department are securing some large and important machines, some of which will be found in this building. Again, the electric light has been used, we may say practically, in this hall. But a very serious difficulty has cropped up with reference to the application of the electric light to the illumination of large halls of this kind, and from a source whence we should have least expected to meet with obstruction. I always blush to name it. It comes from the ladies! The eye of the lady has been educated to adjust her dress to the yellow glow and the warm tint of the gas, and now, when the purer and brighter light of the electric arc comes into play, the colours that looked well by gaslight are found not to look so well by the electric light. But let us hope that the eye which some years ago regarded with complacency the enormous curvilinear development of the crinoline, and which has now become accustomed to more scanty garments, will in a short time get used to the purer rays of the electric lamp. We have here a brilliant display of this light in the roof. In the production of the machine which supplies the currents perfection has been well-nigh reached. From the very best steam-engine only 10 per cent. of the energy of the fuel is obtained; but in the dynamo-electric machine of Siemens no less than 90 per cent. of the energy thrown into it is converted into electric currents. Your Royal Highness, this exhibition is really only illustrative; it is not in any sense competitive. All the gentlemen who have freely and willingly and courteously sent their apparatus here have done so not with the slightest idea of competing with their neighbours, but have taken advantage of the opportunity which the council of this hall have given them to exhibit to the public the results of the trials and experiments of the last few years, and I am sure that I shall be only anticipating the Council in offering our thanks to those inventors who have assisted in making this exhibition what it is. In conclusion, I have only to call attention to the various classes of exhibits. There are in this hall, and outside it, engines of various kinds, exhibited by Robey, Ransomes, Wallis & Steevens, Marshall, and other firms; and we have the Siemens machine, the Gramme machine, the Lontin, Wilde, Wallace-Farmer, and many other lights. We have machines in every stage of their progress. The history of the whole subject is before you. We have hand machines, dynamo machines, magneto machines; we have lamps dependent upon the arc, and others dependent on incandescence; we have electric "candles" and, in short, a collection of apparatus connected with electric lighting such as has never before been brought together in this world.

The Duke of Edinburgh then rose and said,—On behalf of the Council of the Royal Albert Hall I wish to propose to you a most cordial vote of thanks for the very interesting lecture which we have just heard, and to express our warmest thanks to Mr. Preece for the very able manner in which he has explained to us this historical exhibition of the various experiments of past years towards attaining perfection in electric lighting. But on this occasion nearly all those who appear before you appear at a great disadvantage, especially I may say the electric light, for there was not much time given to place all these weighty materials in this hall, or to form the vast number of connexions, and place the large number of wires which convey the electricity from the engines without. Our lecturer this evening has also been at a great disadvantage through not having all the wires laid to his hand, for no one can command properly unless all the wires are laid to his own hand. I am also at a disadvantage, for I was not aware I should be called upon to address you this evening; but I have done so with great pleasure, on my own part, to thank Mr. Preece for the trouble he has taken to explain this matter to us to-night. We have all been much interested, not only by the lecture, but by the experiments we have witnessed. In witnessing them we must have noticed the progress which has taken place from the first experiments which commenced with the lump of coal which lies before me; but, at the same time, we must notice that the electric light is, in its application, still in an imperfect state, and in alluding to that I may say that in this hall experiments have been made by the corporation, and an endeavour has been made to produce electric lighting here as the light, generally, in place of gas. The result is that you see now. The Council feels that this light is still very imperfect, and it will take time and further experiments before this can be remedied; and we trust that the seat-holders and the public will give us their encouragement that we may be able to produce something which will be thoroughly satisfactory. At the same time our lecturer has pointed out to us that, in one point, the electric light has received a thorough and practical application, and that is in lighthouses. I believe that the lighthouses which the Trinity House has lighted by the electric light are superior to any that have yet been established. I feel also perfectly certain that the electric light will form a very great and powerful agent in preventing accidents at sea. The bow lights I have seen illuminated by electricity to-night will, I am sure, prove of great value to the vast number of steam-ships which traverse the seas at enormous speed, and prevent collisions, which often occur now from the defective lights in use. The application of the electric light to protect ships of war from being attacked by torpedo-boats, — the light which we have seen shown by the holophote,— will be of great importance in naval warfare. It remains now for me only to repeat what Mr. Preece has said, to thank those gentlemen who have so kindly come forward to exhibit their machines and instruments for the production of the electric light, and also to say how much we are indebted to the Society of Telegraph Engineers for their co-operation on this occasion. I have now great pleasure in proposing a vote of thanks to Mr. Preece for the very interesting lecture he has given us on this occasion.

The Prince of Wales, who was enthusiastically received, rose and said,—I have great pleasure, ladies and gentlemen, in seconding this vote of thanks.

The exhibition will remain open till (this) Saturday evening, and should be visited by all who are interested in the subject.*

Proposed Municipal Buildings, Greenock. Complaints are made to the effect that the Town Council's own harbour engineer is amongst the competitors.

* Readers who desire information on the general subject may usefully consult a volume just now published, "On Electric Lighting," by Jas. N. Shoolbred. Hardwicke & Bogue, Piccadilly.——A new edition of Noad's "Student's Text-book of Electricity," with an Introduction and additional chapters by W. H. Preece, has been published by Crosby Lockwood & Co., Stationers'-hall-court.

THE CHURCH OF ST. SEPULCHRE, SNOW HILL.

LONDON AND MIDDLESEX ARCHÆOLOGICAL SOCIETY.

At a meeting of this society, held on Monday, the 28th ult., Mr. M. H. Bloxam, F.S.A., in the chair,

Mr. John E. Price, F.S.A., read a paper on "The Church of St. Sepulchre, Snow-hill." He observed that the parish of St. Sepulchre appeared to have been originally of vast extent. It formerly included a large tract of land within the walls of the City of London, running along the course of Warwick-lane about as far as Warwick-square. The portion of the parish within the walls was separated from that in the Liberty and that in Middlesex at the dissolution of the monasteries in the reign of Henry VIII., and was, with the site of the Grey Friars, the parish of St. Nicholas Shambles and that of St. Ewin, formed into the new parish of Christ Church, Newgate-street. Four of the wills under which the parish of St. Sepulchre holds property were proved before that division of the parish, viz., that of William of Newcastle, proved in 1338; that of William Cresewick, proved in 1407; that of Richard Bryerner, 1411; and that of John Joyner, 1427. In the present Liberties of London, the parish of St. Sepulchre in early times followed the course of the wall of the City from Aldersgate-street Ward until it reached the parish of St. Martin Ludgate; it was then bounded by the Fleet river until it reached that part of the parish which is in the county of Middlesex. The latter part of the parish continued along the course of the Fleet until the limits of Clerkenwell parish were reached, and was bounded by that part of the parish of St. Giles, Cripplegate, which is now St. Luke's, Old-street. This large area included the Priory and Hospital of St. Bartholomew, and much of the site of the Charter-house, and probably part at least of the precincts of St. John of Jerusalem. In the time of Henry I. the tracts of land now the parishes of St. Bartholomew the Great and Less were alienated from St. Sepulchre's, as was, in 1371, much of the land on which the Charter-house was erected. St. Sepulchre's parish as now constituted comprises four-fifths within the Liberties of the City of London and one-fifth situate in the county of Middlesex. The first mention of the church is in the twelfth century, the dedication, as implied, in commemoration of the Holy Sepulchre at Jerusalem. In the reign of Henry I., Roger, Bishop of Salisbury, gave the patronage of the church to the prior and canons of St. Bartholomew's, Smithfield, which gift was confirmed by Henry III. in 1253. The church is twice mentioned in the "Liber Custumarum," edited by Mr. Riley, pp. 229-30, 237, under date of 31 Edward I., 1307. It is also mentioned under date 1312. Among the Patent Rolls of the reign of Richard II., date 1392, is an interesting document, viz., letters patent granting, in consideration of 40s. paid by John Staunton and Richard Asshewell, "*custodes fabricæ ecclesiæ Sancti Sepulchri extra Newgate, London*," licence to John Sexy, citizen of London, to give and assign one loft, with the appurtenances, in the suburb of London, held of the king in burgage, to the same custodians, to hold to them and their successors towards the support of the fabric of the aforesaid church for ever. This bequest has been lost sight of or absorbed in later times. In the year 1338, William of Newcastle-under-Lyme bequeathed a considerable estate to the parish. He gives and devises his tenements in the parish of St. Sepulchre, after life estates to his wife and brother, to the vicar and four parishioners of St. Sepulchre, "*ejusdem ecclesiæ custodibus*," these latter being churchwardens of the parish for the time being, and their successors for ever, to found and maintain therewith a chantry and chaplain to celebrate mass for his soul; and he directs that whatever shall be received or raised out of the said tenements and their appurtenances beyond that purpose shall go to the fabric and support of the said church for ever. The lands and tenements thus devised by William of Newcastle were at his death situate in Giltspur-street, Christopher-alley, near Holborn-conduit, and Chick-lane. These lands are now represented by premises in West Smithfield, Bear-alley, Parliament-street, Palace-yard, Durham-yard, and Greville-street, Hatton-garden. In Maitland's "History of London" the value of the Newcastle gift is put down at the sum of 127*l.* The revenue now accruing to the parish from the property is very consider-

able. There was no distinction in the bequest as to "St. Sepulchre, London," or "St. Sepulchre, Middlesex." The funds were to be appropriated to the requirements of the building, and to that alone. The question has now arisen as to how the large income accruing from the bequest shall be expended, and under whose control. It is the accumulation of this money that has led to all the unnecessary and uncalled for changes and alterations in the form and arrangement of the building. Had there been no money to spend, the parishioners might now have had their church as it existed for generations. If it had been necessary to make a rate for the purpose, or to call for a public subscription, we should have heard but little of the restoration of the building. Maitland, in his description of the parish, divides it into two liberties. He has two accounts, one for the City liberty, the other for the liberty in Middlesex. The officers for the former are described as being four churchwardens and six overseers, and there was a rating of 1,286 houses. The officers for the latter were one churchwarden, four overseers, five constables, nine head-boroughs, "four scavengers, who pay the raker for cleansing the streets and carrying away the ashes the sum of eighty pounds per annum," one beadle, and five watchmen, and there was a rating of 626 houses. This description is from the edition of 1756. While there are now two vestries, for the convenience of local government, yet, to all intents and purposes, and especially for those by their nature ecclesiastical, St. Sepulchre's parish can be but one. The early engravings of the church illustrate the niche over the porch enclosing the statue of Chancellor Popham; and when the restoration of the church was first contemplated as regards the tower and porch, it was intended by the architect, Mr. W. Pettit Griffith, F.S.A., that a figure of the Chancellor should be restored to its proper position over the outer doorway; but it was decided that the room over the porch was required for office purposes, therefore an oriel window was substituted, to the injury of the general design. The arms of Popham were *asure*, on a chief *gules*, two bucks' heads cabossed *or*. Stow says that they were represented in the windows of the chapel on the south side. In the course of the works a piscina has been discovered in the south wall. This was probably the situation of the Popham Chapel. In addition to the Popham Chapel, there were chantries belonging to guilds or fraternities. Among other remains of interest, the piscina belonging to St. Stephen's Chapel has been discovered, as has been another, with indications of colour on the mouldings, at the east end of the north aisle. Near to this chapel, indications have been found of the ancient rood-loft and the doorway by which it was approached. The building, as erected in 1450, has been described by Mr. Pettit Griffith.* The room over the porch appeared to have been used as a schoolroom, for in a will of one John Gynes, bearing date 1592, the testator described himself as "schoolmaster within St. Sepulchre's Church," and left his body to be buried at the foot of the stair leading up to the schoolroom. The church was considerably damaged, but by no means destroyed, by the Great Fire of London in 1666. Since the casing which covered the original walls has been removed, the terrible nature of the fire finds illustration in the effect it has left upon the stone. In places, the stone,—for example, that composing the magnificent and lofty arches of the tower,—has been literally calcined by the heat. The main injury done was to the interior. The tower, still one of the finest landmarks of the City, was left standing. The porch on the south side, St. Stephen's Chapel, and the walls generally, it was possible to repair. Soon after the Fire the work of rebuilding commenced, under the direction of Sir Christopher Wren. He had but to reconstruct the interior, with a portion of the east wall, leaving the flanks, with their mullioned windows, perfect, and making use of the old walls as far as they went. In Maitland's time the tracery still remained in the windows and from the engraving he has given of the south side of the church it appears that the design of the filling-in of the windows resembled those of the porch still existing. Original drawings of these windows, by John Carter, still exist, and are in the possession of Mr. John E. Gardner, F.S.A., therefore they could have been accurately reproduced. It has been asserted, and is very generally believed, that Wren had little or nothing to do with the reconstruction of the church, but this belief may have arisen from the fact of no entry having as yet been found in the parish books wherewith his name can be associated. But it may be observed that, with the vast number of churches which at this time were confided to his care, it would by no means be surprising for such a record to be passed over. It is, however, abundantly clear that Wren was associated with St. Sepulchre's Church, for in his biography, written by James Elmes, under the year 1674, we read:—"St. Sepulchre's, on the north side of Snow-hill, opposite the Old Bailey, which was almost demolished by the Fire, began to be rebuilt in 1670, was finished about this year. This church has nothing remarkable, either in design or execution, being only a restoration and partial rebuilding on its former plan." But there is, however, more conclusive evidence. In the Bodleian Library at Oxford there are preserved the actual ledgers belonging to Sir Christopher, and among the accounts there appear the actual sums paid over to him by Dr. Bell, the vicar of the parish at the time. Dr. Coxe, of the Bodleian Library, having been kind enough to send to Mr. Price a copy of this interesting record, we are enabled, by the courtesy of Mr. Price, to print it. The following is the extract from Wren's ledger.*

"ST. SEPULCHER'S, WILLIAM BELL, MINISTER.

DR.

Per money received of Sir Christopher Wren, on account of this parish church, as by the severall payments following, attested by witnesses, do appear.

1670. Aug. 19.	Recd. then the sume of ...	£1,700	0 0
and 25.	.....	1,500	0 0
1671. July 6.	.....	200	0 0
,, 26.	.....	200	0 0
Sept. 9.	.....	500	0 0
1672. Aug. 29.	.....	395	0 0
	End of the first state, &c.		
1674. Mar. 23.	.....	100	0 0
July 11.	.....	50	0 0
Aug. 7.	.....	50	0 0
1675. July 31.	.....	50	0 0
Oct. 7.	.....	50	0 0
1676. Nov. 15.	.....	100	0 0
1677. July 4.	.....	50	0 0
Sept. 22.	.....	48	4 0
	Total.....	£4,993	4 0

PER CONTRA.

Per his disbursements laid out to several workmen for repairing the church as by an order dated June 12, 1671, £4,993. 4s."

That both sections of the parish had in this troublous time to act in concert over such an important matter as the rebuilding of their parish church is evidenced by the entries, careless as they appear to be, in the Vestry minutes. About this period the twelve Tuscan columns were constructed. These are of large dimensions. They are raised on octagonal plinths, placed, in fact, upon the foundations of the pillars belonging to the original building. These plinths were of the same height as the recent pewing, but now they are out of proportion as to height, owing to the unnecessary lowering of the floor. Mention of these pillars occurs in the parish books in 1667, where there is a minute stating that the Vestry treated with one Mr. Marshall concerning the twelve pillars of the church, and it was resolved that he should "prepare them with as much speed as he can." These columns were connected on either side by semicircular arches. These arches were not constructed at the same time as the columns, but at a comparatively recent period. Christ Church, in Newgate-street, is one of the few churches having columns without arches. This peculiarity was altered at St. Sepulchre's when the new roof was added in the year 1835. The ceiling of the middle aisle is slightly coved, springing from behind the cornice, and is divided into seven compartments by horizontal bands. The aisles have groined ceilings, ornamented at the angles with doves. The galleries constructed in the seventeenth century at the time of the general repair occupied the whole of both aisles except the extreme eastern division on each side, and it was continued in a sweeping direction across the west end, which portion was sustained on Composite columns. The fronts of the galleries retired behind the main columns; they were panelled, each panel being filled with carving in relief. In 1863 alterations were made to these galleries. Under date of November 9th a committee was appointed to issue directions as to the removal of the pulpit, and to alter, take down, and rebuild, if necessary, the galleries on the north side. In the following year a similar arrangement took place with respect to the south gallery. In 1686 there were repairs ordered to the south porch, and a vault was constructed beneath St. Stephen's Chapel. The floor of the porch was raised, the chancel paved, and the church-gate altered. The galleries have now been entirely destroyed, and their removal has led to a series of difficulties which might well have been anticipated in an attempt to harmonise work constructed in 1450 with that of the seventeenth century. The gallery at the west end divided the Gothic tower from the Classic nave. This, of course, all told its own tale; it spoke for itself, and the most ordinary observer could understand the line of demarcation. The organ, which also stood in the gallery of the west end, shut out the pointed arches of the tower. All this has been changed. The organ has been taken down, to be re-erected, it is said, in St. Stephen's Chapel. It was once believed to be the oldest and one of the finest instruments in London. It was built by Renatus Harris and Byfield in 1677, and had forty stops. About forty years ago, a set of double open pipes was added; they were those previously used in the instruments erected for a great musical festival in Westminster Abbey.* In the parish books there are some amusing records of squabbles between Renatus Harris and the churchwardens concerning the building of the organ. In 1790 the church was in a state of decay. Mr. Griffith records that in that year the walls were cased with Portland stone, and all the windows were taken out and replaced by others with plain semicircular heads. The battlements were taken down, and a plain stone parapet substituted. The roof of this time was wagon-headed. The angle piers of the tower being weak, they were strengthened by inserting within the fine pointed arches semicircular arches and Bath stone Tuscan columns. When about to construct the new roof, it was found that the columns on the south side of the church were considerably out of an upright line (the sinking of the side wall having drawn them over), and fears were entertained that it would be necessary to take them down, by which a considerable increase of expense would have been entailed. The architect, however, with great ingenuity, contrived, by sawing each of them half way through at the base, and by either introducing or removing a wedge-shaped piece, as the case might be, to force them into their proper position.†

To the discussion which followed the reading of the paper we may return. The question was asked by more than one speaker, "Did anybody, even Mr. Billing [the architect at present in charge of the works] himself, know what was intended to be done with the interior of the building when the clearing out now in progress is finished?" In reply to this question Mr. Billing did not state that any definite plan had yet been agreed upon.

EXHIBITION OF CUTLERY.

THE Earl of Carnarvon last week opened an exhibition of cutlery at the hall of the Cutlers' Company of London, in Cloak-lane, Cannon-street. The exhibition, which is the first held by this company, includes specimens of domestic cutlery, surgical cutlery, and sword cutlery, sent by manufacturers and artisans in London, Sheffield, and Birmingham, and a loan collection of much interest.

According to the Master (Mr. T. G. Pocock), previously to the reign of Henry V. there were three trading fraternities or guilds in existence, viz., the Forgers of Blades or Bladers, the Makers of Hafts, and the Sheathmakers; but in the fifth year of the reign of Henry V. these were incorporated as one united body by the name and style of "The Master Wardens and Commonalty of the Mystery of Cutlers of London." Various other charters had been granted from time to time. That under which the company was now governed was obtained from James I. in the year 1607, and this charter gave the company power to make ordinances for the government of all using the mystery, art, or trade of cutlers within the City of London, or suburbs thereof, &c., with right of search and power to levy penalties for all deceitful wares.

When we receive no intimation of exhibitions or meetings in connexion with subjects of which the *Builder* takes cognisance, we are led to con-

* See *Builder*, vol. xxxiii., p. 755. A view of the church, showing the restored tower and porch, accompanied the description.

* Rawl. MSS., B 389, fol. 104.

* Godwin's "Churches of London," vol. i.
† Ibid., vol. i., p. 7.

clude that they are badly managed, and we have usually found the impression justified. Tried by this test, the Cutlers' Company's exhibition is badly managed.

THE HACKNEY NEW INFIRMARY.

THE new infirmary at Hackney, proposed to be erected on the Castle House Estate, adjoining the workhouse, which the guardians recently purchased, is to be on the pavilion principle, and to consist of four blocks. The plans having been forwarded to the Local Government Board for their inspection, the Board have returned them, suggesting certain alterations and additions. They advise the guardians that in erecting the buildings the several pavilions should stand at a distance of not less than 70 ft. apart, and that the area of the window space should not be in greater proportion than the rate of 1 superficial foot to every 70 ft. of cubic space in the ward; the windows to be arranged so as to be about 12 ft. from centre to centre, and carried up to the ceiling-level, or to within 12 in. of the height of the ceiling. They also suggest that there should be some small wards erected for special cases, and that a ward holding three or four beds, arranged in connexion with each of the larger wards, would be found the most suitable arrangement. At their last meeting the guardians instructed the Building Committee to confer with Messrs. Lee & Smith, the architects, respecting the suggestion received from the Local Government Board, and advise the guardians on the matter.

PROPOSED CONVERSION OF THE ST. KATHERINE'S DOCKS.

FROM a communication which has just been made to the Corporation, it appears that the directors of the London and St. Katherine's Dock Company contemplate the appropriation of the St. Katherine's Docks to other than their present purposes, on the completion of the extensive new Victoria Dock Works, now in progress. At the meeting of the Corporation, held last week, a letter was read from Messrs. Vigers, surveyors to the Dock Company, to the effect that, as the question of improved access to Billingsgate Market, or its removal, was now before the Corporation, they begged to draw the Corporation's attention to the fact that the Company, having greatly increased the Victoria Docks, were in a position to treat for the purchase by the Corporation of St. Katherine's Docks as a site for a new fish-market. The communication added that the Great Eastern, Great Western, and the three northern railways had direct railway communication with the docks, while the street improvements and proposed new bridge over the Thames would afford good road access. The communication is under the consideration of the Markets Committee of the Corporation.

PUBLIC BATHS AND WASHHOUSES FOR THE PARISH OF ST. GEORGE THE MARTYR.

THE authorities of the parish of St. George the Martyr are about to proceed with the erection of public baths and washhouses, provided a faculty, which is necessary for the site that has been selected, can be obtained. At last week's meeting of the vestry, the commissioners who had been appointed by that body to carry out the undertaking requested permission to apply for a faculty to build the baths and washhouses for the parish on the site of the Lock Burial-ground, Old Kent-road. Mr. Pocock, in moving on behalf of the commissioners that the required permission be granted, stated that the site now proposed was the freehold of the parishioners, and situated in the midst of a densely-populated neighbourhood. If the faculty were obtained, it was proposed to erect two large swimming-baths, and a number of men and women's private baths, besides washhouses. One of the swimming-baths would be 93 ft. long and 28 ft. wide, and the other 45 ft. long and 25 ft. wide. The private baths would consist of first and second class, both for men and women. Attached to the washhouses there would also be drying-rooms for the clothes, with every convenience. The estimated cost of the buildings was 15,000*l*. He added that it was not necessary to say anything more in favour of baths and washhouses, for their great utility and advantages to the community were admitted. Judging from the working of the Bermondsey baths, he thought there could be no doubt that the baths, if built upon the proposed site, would be remunerative, and at the same time would be an ornament to the road. In answer to a question, the surveyor said that the estimated cost of excavation and removal of the bodies was 1,000*l*. One of the members of the vestry (Mr. Bordman) thought a burial-ground was a most objectionable site for baths. The permission to apply for a faculty was almost unanimously adopted, twenty-three voting in its favour, and only two against it.

THE LONDON STEAMBOAT COMPANY.

PROPOSED LEASE OF THE PROPERTY.

IT transpired at the annual meeting of the proprietors of the London Steamboat Company that there is a probability of the working of these river steamers being undertaken by a private capitalist under a lease. According to a statement made by the chairman of the company, it appears that Mr. J. O. Lever has proposed to lease the fleet, property, and business of the Company for a period of twenty-one years, undertaking to pay 5 per cent. on the 200,000*l*. preference stock now intended to be issued, and the sum of 1,500*l*. per annum for remuneration of three directors, to be elected by the shareholders, and to represent the Board. The chairman stated that after the circular announcing Mr. Lever's proposal had been issued to the shareholders they were advised by their solicitor that sufficient notice had not been given. Consequently it was unnecessary to discuss the subject until the next meeting. The chairman added that the Board of directors approved of the offer, and that he would leave the shareholders to say whether it was not better to have a fixed guaranteed dividend, extending over twenty-one years, at 5 per cent., than a fluctuating one.

ASPHALTE *v.* YORK PAVING IN FULHAM.

THE subject of asphalte as compared with York paving has latterly engaged much of the time and attention of the Fulham District Board of Works. At a recent meeting, the Works Committee recommended that all new streets should be paved with 3-in. York paving, but this was referred back to the committee as to asphalte; and at the last meeting of the Board the committee again reported, stating that they had viewed the footways in the district laid with asphalte, and found it very unsatisfactory, and they now recommended that each case be considered on its merits, and that no asphalte be laid of a less thickness than ¾ in. This recommendation gave rise to much discussion, during which there was considerable diversity of opinion. In the course of the discussion, Mr. Mugford, one of the members, said that York paving was much superior to asphalte, though the latter might do very well for builders, whose interest in a street might cease in twelve months. Another speaker thought the Board should only permit asphalte in very exceptional cases. York paving would last twenty years, but the asphalte in certain roads in the parish was worn out in two or four years. As a speculative builder, he would rather be charged for asphalte, but as a ratepayer he would vote for York paving. On the other hand, Mr. Slattery said the asphalte laid down many years ago in Bond-street and Broad-street was as good as new now. He moved that the report be again referred back. It was stated during the discussion that ¾-in. asphalte cost 7s. 9d. per square yard, and York paving 7s. 10d. per square yard. The report and recommendation of the committee was ultimately adopted.

THE "BLACK AND WHITE."

WITH the exhibition season, and in its due succession, the "Black and White" will open at the Dudley Gallery. This ought to be one of the most useful and instructive exhibitions in the metropolis; but it never can be so as long as its *raison d'être* is misapprehended, and the claims of book illustrations and crude sketching take precedence of the higher order of design and more ambitious endeavour. We are so absolute, and work upon a notion so completely in some narrow and immediately literal bearing, without attempting to grasp the spirit of what we are about, that it cannot be wondered at if many seemingly promising projects fail. "Black and White" conveys to the superficial and offhand Englishman nothing but the notion of black etchings, ink, chalk, and charcoal on white paper. These means are also associated in his mind with chiaroscuro and Rembrandt. This is about the limit of his mental conception of the matter, and from this "stump" standpoint he begins to "orate" and write grandly on the advantages of the study of chiaroscuro; and when the hack critic sees a liberal display of blackness he estimates merit by the quantity of "oscuro." Now all this is exceedingly absurd and one-sided. This absolute Black and Whiteness is of very recent date in the annals of art, and belongs *par excellence* to the Dutchmen, who, on the rule of reaction, sought solace from scrubbed floors and whitewash in positive black and white art,—in etching. This was an art which was quite unknown, in the Dutch sense, to the higher and far more intellectual Italian school,—the school which ought to be held up as an example to our students. With the great Italians, black was not considered essential, either to the development of the design or of the chiaroscuro, by masters who, compared with the Dutch painters, were intellectual giants. Red, with the Italians, was far more in favour than black; and, in truth, the thunders and flashes of black and white are not needed to set forth the higher forms of human action, requiring as these do a finer and more plastic sense of composition, severer drawing, and defined human expression. The broad effects of light and shade are all very well in their way, but it should be remembered that these are not the highest aims of art, and if the Dudley Gallery is to be a success it must accentuate the higher forms of design and drawing, and give prominence to cartoons and preparatory work for the grander order of invention. Having said thus much, we look forward with our usual interest for the forthcoming exhibition.

THEATRES AND THE METROPOLITAN BOARD OF WORKS.

THE following are the regulations made by the Metropolitan Board of Works under the provisions of the Metropolis Management and Building Acts Amendment Act, 1878:—

1.—These regulations shall apply to all theatres, houses, or places of public resort within the metropolis, to be kept open for the public performance of stage plays, and to all houses, rooms, or other places of public resort within the metropolis containing a superficial area for the accommodation of the public, of not less than 500 square feet, to be opened or kept open for public dancing, music, or other public entertainment of the like kind under the authority of letters patent from Her Majesty the Queen, her heirs or successors, or of licences by the Lord Chamberlain of Her Majesty's Household, or by any Justices of the Peace, or by any Court of Quarter Sessions which may be granted for the first time after the 22nd day of July, 1878.

2. *Drawings of Theatres, Music-halls, &c., to be submitted to Metropolitan Board of Works.*—Every person who, for the first time after the making of these regulations, may be either desirous of obtaining authority to open any house, or other place of public resort, within the metropolis, for the public performance of stage plays, or to open any house, room, or other place of public resort within the metropolis containing a superficial area for the accommodation of the public of not less than 500 square feet for public dancing, music, or other public entertainment of the like kind, shall give notice of such desire to the Metropolitan Board of Works. The notice must contain a statement as to the nature of the interest of such person in the premises so proposed to be opened, and be accompanied by plans, elevations, and sections of such house, room, or place of public resort, or of the premises of which such house, room, or place of public resort may form part, drawn to a scale of not less than one-eighth of an inch to a foot, and by a block plan showing its position in relation to the premises adjacent, drawn to a scale of not less than 1 in. to 20 ft., and in the case of new buildings, or of buildings to be adapted as a place of public resort, must be also accompanied by a specification of the works to be executed, describing the materials to be employed and the mode of construction to be adopted, together with such other particulars as may be necessary to enable the Board and its officers to judge whether the requirements of these regulations will, when the building has been completed, have been complied with. The notice must be also accompanied by a detailed statement of the respective numbers of persons proposed to be accommodated in the various portions of such house, room, or place of public resort, and of the area to be assigned to each person, which shall not be less than 1 ft. 8 in. by 1 ft. 6 in. in the gallery, nor less than 2 ft. 4 in. by 1 ft. 8 in. in the other parts of the house, room, or other place of public resort.

3. *Walls.*—Every such house, room, or place of public resort shall be inclosed with external walls of brick or stone, or partly of brick and partly of stone. The thickness of such walls shall not be less than the thickness prescribed by the Metropolitan Building Act, 1855, for walls of similar height and length in buildings of the warehouse class.

4. *Proscenium Wall.*—In any house or other place of public resort, for the public performance of stage plays, or where a proscenium shall be erected, the proscenium wall shall be of brick, not less than 1 ft. 1 in. in thickness, and shall be carried up to a height of 3 ft. above the roof, and be carried down below the stage, to the level of the founda-

tion of the external walls. No openings shall be formed in the proscenium wall, with the exception of a doorway into the orchestra, and one doorway on each side of the stage for communication with the auditorium. These doorways shall not be more than 3 ft. 6 in. wide, and shall be closed with iron doors, fixed without woodwork. The decorations round the proscenium shall be constructed of fire-resisting materials.

5. *Public Staircases, Corridors, &c.*—The staircases and the floors of the passages, lobbies, corridors, and landings shall be of fire-resisting materials. Every staircase for the use of the audience shall be supported and enclosed by brick walls. The treads of each flight of stairs shall be of uniform width. No staircase, internal corridor, or passage-way for the use of the audience shall be less than 4 ft. 6 in. wide. Every staircase, corridor, or passage-way for the use of the audience, and which communicates with any portion of the house intended for the accommodation of a larger number of the audience than 400, shall be increased in width by 6 in. for every additional 100 persons, until a maximum width of 9 ft. be obtained. Provided always that in every case where the staircases are 6 ft. wide and upwards a dividing handrail be provided. A clear passage or gangway, of not less than 3 ft. wide, shall be preserved round every part appropriated to the audience, except that next the proscenium or place of performance.

6. *Ironwork.*—All ironwork used in construction shall be protected against the action of fire in such manner as may be required by the Board.

7. *Means of Exit.*—In all cases where a portion of the audience is to be accommodated over or at a higher level than others of the audience, a separate means of exit, of the width above prescribed for staircases, internal corridors, or passage-ways, and communicating directly with the street, shall be provided from each floor or level. Separate tiers of boxes shall for this purpose be reckoned together as forming one floor or level. One additional exit, at the least, communicating with the different levels, and opening directly into the street, must also be provided.

8. *Doors.*—All doors and barriers shall be made to open outwards.

9. *Warming.* — In theatres and places where the auditorium and stage shall be warmed artificially, hot water only, and that at low pressure, shall be used, and the warming apparatus shall be placed in a position to be approved by the Board.

10. *Ventilation.*—All openings for ventilation shall be shown on the plans, and properly described in the specifications. The openings shall be made in such places and in such manner as may be approved by the Board.

11. *Workshops.*—No workshop, painting-room, or dressing-room, shall be formed or constructed over the auditorium, or in the space under the same.

12. *Scene-docks, &c.*—No scene-dock, property-room, or store-room, shall be permitted within any house, room, or other place of public resort, unless such scene-dock, property-room, or store-room be separated from the house, room, or other place of public resort, by brick and fire-proof construction.

13. *Water Supply.*—In any case where there are not fire mains on constant supply, there shall be provided on the top of the proscenium wall or at some other place to be approved by the Board, two cisterns, each capable of containing at least 250 gallons of water for every hundred persons of the audience to be accommodated in the building. Fire mains shall be connected with these cisterns, and extend round the whole circuit of the building, and be fitted with hydrants in such places and manner as may be approved by the Board.

14. *Gas.*—All gaspipes shall be made of iron or brass. No white metal pipes shall be used in any part of the building.

15. *Separation of Buildings.*—In cases in which a house, room, or other place of public resort, forms a part only of a building, such house, room, or other place of public resort, shall be separated from the other parts of the building by proper party walls or party structures.

16. *Alterations and Additions.*—Notice shall be given to the Board of any intended addition to or structural alteration of any house, room, or other place of public resort, in respect of which the Board may have granted a certificate to the effect that such house, room, or other place of public resort, was on its original completion in accordance with the foregoing regulations, or otherwise, in compliance with the said Act, and the conditions required by the Board applicable thereto. Such notice shall be accompanied by plans, elevations, and sections, showing such additions or alterations, and also by a specification of the works to be executed, in the same manner as in the case of a new building to be certified for the first time by the Board; and the Board will, if necessary, cause a fresh survey of the building to be made.

17. Inasmuch as by section 12 of the said Act, the Board may, from time to time, in any special case, dispense with or modify its regulations, all applications for dispensation or modification must be in writing, addressed to the Board, and contain a statement of the facts of the particular case, and the reasons why it is desired to modify or dispense with these regulations as applicable thereto.

Radstock.—The parish church of Radstock has just been reopened, after restoration and partial rebuilding. The old chancel has been taken down, the east end entirely cleared away, and the church extended about 30 ft. to the eastward. A new chancel has been built, the old galleries removed, and a new roof has been placed upon the building. There have also been built a new organ-chamber and vestry. To compensate for the loss of the galleries, 113 additional seats have been placed in the church, which will now accommodate 520 worshippers. There is at present only a north aisle, but it is proposed to place another aisle on the south side when necessary. The old church had no aisles, and the only portions of the structure which remain are the tower, a portion of the south wall, and the south porch. The tower has not been touched, with the exception of strengthening and restoring the internal arch. The architects are Messrs. Willcox & Wilson, Bath; and the contractors, Messrs. Wall & Hook, Stroud.

ANNUAL GENERAL MEETING OF THE ROYAL INSTITUTE OF BRITISH ARCHITECTS.

At the annual general meeting, held on Monday evening, the 5th of May, the secretary read a letter from Mr. S. W. Kershaw, M.A., stating that, in consequence of his increasing duties at Lambeth Palace Library, he felt it necessary to tender his resignation as librarian of the Institute, an office which he had held for eleven years, and which he relinquished with great regret. Several members spoke with great approbation of Mr. Kershaw, and a vote of thanks to that gentleman for his lengthened and valuable services was passed.

In reference to the forthcoming international exhibitions, to be held at Sydney and Melbourne, the president, Mr. C. Barry, read the following letter:—

"Marlborough House, Pall-mall, S.W.
21st April, 1879.

Sir,—As President of the Royal Commission for the Australian Exhibitions, may I request you to have the goodness to invite the members of the Royal Institute of British Architects to lend me their valuable assistance in promoting the success of these exhibitions.

It is unnecessary to enlarge on the favourable opportunity afforded by these exhibitions for promoting friendly intercourse with our fellow subjects in the colonies, for increasing and developing the demand for works of art and industry produced in the mother country, and for advancing the interests of trade and commerce in general.

With these objects in view, I would ask you to bring under the notice of the members as soon as possible the desirability of securing such an exhibition of drawings as will maintain the reputation of British art at the Sydney and Melbourne Exhibitions, where, I am informed, the artists of Italy, France, Germany, and Belgium will be well and largely represented.

The Exhibition at Sydney will be opened on the 1st of September next, and all objects intended for it should be despatched not later than the first week in June. I would therefore request that the members of the Institute will have the goodness to take this matter into consideration at the earliest opportunity.

It is proposed that at the close of the Exhibition, in Sydney, the drawings should be transmitted to Melbourne for the Exhibition which is to be held there in the following year.

I have the honour to be, sir, your obedient servant,
ALBERT EDWARD P.

The President of the Royal Institute
of British Architects."

It is understood that the architectual works sent to Paris, together with others that might be produced, will be suitable for exhibition in Australia,—seeing that as very few Australians were able to go to Paris, these drawings would be new to them, and might satisfactorily be exhibited as illustrations of British Art.

With reference to the proposed improvement of the premises, a modified plan was proposed, which may be carried out for about 1,200*l.*, with 800*l.* for fittings and furniture, and the Council were empowered to proceed with the works.

The Council have negotiated (subject to the approval of the general body) a new lease for seventy-nine years from the Architectural Union Company, at an increased rental of 100*l.* a year.

The report of the Council for the official year having been received and adopted, the following office-bearers were elected:—

President.—John Whichcord, F.S.A.

Vice-Presidents. — Thomas Hayter Lewis, F.S.A., Horace Jones, and Edward Middleton Barry, R.A.; John Macvicar Anderson, Arthur William Blomfield, M.A., David Brandon, F.S.A., Arthur Cates, Ewan Christian, Joseph Clarke, F.S.A., Henry Currey, John Gibson, Octavius Hansard, John Honeyman (Glasgow), Edward I'Anson, F.G.S., John Loughborough Pearson, A.R.A., F.S.A., George Vulliamy, Alfred Waterhouse, A.R.A., Thomas Worthington (Manchester).

Honorary Secretary.—Thomas Henry Wyatt, F.S.A.

Secretary.—William Henry White.

[The above form the Council.]

Treasurer.—Sir Walter Rockliffe Farquhar, bart., Hon. Associate.

Solicitor.—Frederic Ouvry, F.S.A., Hon. Fellow.

Auditors.—William Allen Boulnois, Fellow, and Francis Thomas Dollman, Associate.

On the motion of Professor Donaldson it was resolved unanimously,—"That the grateful acknowledgments of the Institute be presented to Mr. Charles Barry for the efficient and courteous manner in which he has discharged the various and specially important duties of his presidentship—including his constant attendance at the Paris Exhibition—and by which the efficiency of the body has been materially improved and its influence strengthened."

Mr. Edwin Long's Fine Picture, "The Pool of Bethesda," is on view at Mr. Arthur Lucas's Gallery, Duke-street, Piccadilly. Although exhibited in 1876 at Burlington House, it was so placed that comparatively few of the visitors saw it, and it now comes to the notice of the majority of persons as a new picture. It will make a delightful engraving.

EMPLOYERS' LIABILITY FOR INJURIES TO SERVANTS.

At a meeting of the Law Amendment Society, held on the 29th ult. in Adam-street, Adelphi, Mr. Joseph Brown, Q.C., read a paper "On the Bills before Parliament for extending the Liability of public Companies and other Employers for Injuries to their Servants arising from Accidents,—viz., the Attorney-General's Bill, Mr. Macdonald's Bill, Earl de la Warr's Bill, and Mr. Thomas Brassey's Bill." The chair was occupied by Mr. T. Brassey, M.P.

Dealing first with Mr. Macdonald's Bill, Mr. Brown said that the Bill proposed to sweep away altogether any defence founded on the doctrine of common employment in the same service, or founded on the fact that the injured servant thoroughly and voluntarily incurred the risk; and his Bill extended to all servants in all employments, and of course to domestic servants. He submitted that this great extension of the employers' liability was both unjust and impolitic. It seemed plain that they could not do anything more likely to promote accidents than to take off all responsibility from the men whose negligence caused them. Mr. Macdonald's Bill might also have the effect of inducing a vast number of men who now insure against accidents in various friendly societies to withdraw their subscriptions, and rely on the employer for indemnity. The Attorney-General's Bill was aimed at railways, mines, factories, and other works. The effect of this Bill was to make the owners of railways, mines, manufactories, and other works liable to their own workmen for injuries caused by the neglect of any "servant in authority," this phrase being carefully defined in the Bill so as to include all persons employed to manage the whole or any part of the works, but to exclude all others. He was unable to see in the Government Bill any sufficient advantages to justify the extension of an inequitable rule of law to a new class of cases, or to atone for the violation of principle involved in it. Both of the other Bills embraced the provisions of the Government measure, and were therefore open to the same remarks; but both of them went a good deal further, for they would embrace not only managers, but even foremen or overseers,—in fact, any one who gave orders to the men. Another provision found in both the Bills made the employers liable for all injuries to a workman arising from defective works, machinery, plant, or stock. None of the Bills contained any clause to prevent a workman from contracting himself out of the Act. But suppose they were to enact that no contract should deprive a workman of the benefit of the Act, what would be the probable result? A large employer would probably think it necessary to insure all his workmen against claims under the Act in some accident insurance society or in some friendly society, and to reduce the wages by the amount of the premium. Consideration led to the conclusion that an insurance by the workman himself, and not by the employer, was the only proper and expedient kind of insurance for the case. He had already advocated a system of compulsory insurance, to which both employers and workmen should contribute.

The Chairman said his conviction was that under existing law and practice the railway companies did bare justice to their men in numerous cases of accident. It seemed to him that when an individual had obeyed an order that he was bound to obey, the employer should be responsible if that order had been wrongly given.

Sir Arthur Hobhouse said the exception of the law was irrational, but perhaps it would lead to show that the law itself was irrational.

Mr. Macdonald, M.P., said the reports of the inspectors proved that 95 per cent. of the large accidents that had occurred in the mines were traceable to the employers or managers, and not to the recklessness of the fellow-workmen.

Mr. Graham, who stated that he was connected with the railway servants, gave the workmen's view of the question. They had gone in strongly for Mr. Brassey's Bill and did not agree with Mr. Macdonald's; for while they believed those in authority should be made responsible, they did not agree in a law making the master responsible for the act of a servant to a servant. The Attorney-General's Bill was excellent to a certain point, but in defining who the person in authority should be the value of the Bill was taken away. He argued that the Bill was simply an electioneering dodge.

Mr. Findlay, of the London and North-Western Railway Company, said there were 275,000 railway men in the kingdom. The Amalgamated Railway Society in itself did not represent five per cent. of the railway men.

WORKMEN AND HIRERS.

ORRIS *v.* SHAW AND SON.

EDWARDS *v.* SHAW AND SON.

Both these actions, in the Westminster County Court, before Mr. Judge Bacon, were test actions of importance to employers and workmen in the building trade. The plaintiffs were both bricklayers, and the defendants builders and contractors carrying on business in Page-street, Westminster. The action was brought in both cases to recover the sum of 30s., being for wages at 9d. per hour, alleged to be accruing due when the plaintiffs left the defendants' employment. Mr. Henry Kisch, who appeared as counsel for the plaintiff, said that the claim was for wages from the 8th to the 15th of March. When the plaintiff applied to Mr. Goodhall, defendants' agent, for the balance, he was referred to a Mr. Pugh, a builder who had taken the works on the Cadogan Estate in Hans-place under a sub-contract, and consequently the defendants were not liable.

The plaintiff E. Orris, called, said on the 11th of December he applied for work on the Cadogan Estate, and saw Charles Goodhall there, and was told that he was manager for the defendants, and he could commence work. He did so at once, and remained there till the 15th of March. He had previously paid him all sums as the defendant's agent, except the sum accruing due from the 8th to the 15th of March. He had all along considered Goodhall as deputy-foreman to the defendants. In reply to Mr. Kisch, the plaintiff said he had never seen a Mr. Metherall, and had not received any instructions from him, but all general instructions were given by Goodhall, who had paid all wages up to Saturday, 8th March.

In cross examination plaintiff said that he saw Mr. Pugh during the second week he was employed, and saw Mr. Metherall continually on the work, but he never interfered, as he always acted under the direction of Goodhall. Mr. Pugh sometimes paid as well as Goodhall, but Mr. Metherall never did. When he applied for his money to the defendant he was told that, after the works had been commenced, Pugh had entered into a sub-contract to do the work, and he must look to Pugh for payment, as he only was liable.

At this stage of the case Mr. Henry Kisch addressed the Court in support of the plaintiff's case, and said as this was a test action he should not call the other plaintiff, as his honour's ruling would affect the interests of many men similarly situated.

Plaintiff recalled, said the defendant had seen him at work, and complained that the bond in the front of the work was not correct.

At this stage of the case the learned judge considered there was no liability whatever on the part of the defendants unless Mr. Kisch could prove that Goodhall was the agent of Pugh, which had not hitherto been done.

The defendants here put in the sub-contract entered into with Pugh, after looking at which his honour said that although it might appear hard to the plaintiffs to rule in the defendants' favour, still the law compelled him to do so. In future it would be most necessary that all workmen should ascertain by whom they were really engaged by calling at the office before entering upon their employment, and ascertaining whether or no there was a sub-contract in the way.

Judgment was accordingly entered for the defendants, leaving the plaintiffs to sue either Goodhall or Pugh for their money.

WEYMOUTH DRAINAGE.

In a recent issue a letter appears on the above signed "Radipole," who thinks the amount of money already spent is not exactly known, and that the plan adopted by Sir John Coode is a very good one, inasmuch as all his outlet-pipes are so arranged as to be able to concentrate the sewage at one given point. Allow me to say again the sewage flows from the pipes into the harbour and breakwater, where it is concentrated by the incoming tide, and carried up over the dam, and the greater portion there remains deposited on the sand, &c., forming an intolerable nuisance at times.

The amount spent on the dam has been placed at various amounts, from 6,000*l.* and upwards, but "Radipole" corrects all by stating the amount to be 13,000*l.* So much the worse for the ratepayers. If the dam was no part of the drainage scheme, there was not the slightest necessity for putting it across the backwater, now was there any necessity for borrowing and spending so large an amount of money on a system of drainage which it was foretold would be a failure, and as was lately proved before the magistrates in the case of Betts & Co. by Major-General Baugh, Colonel Scott, Captain Prowse, Captain Neale, Mr. J. Venour, Mr. R. C. Bennett, C.E., Mr. Samuel Jackson, architect and surveyor, and Mr. Tregarther, her Majesty's Inspector of Schools, and many others, that the nuisance was caused by the dam being placed there, forming a receptacle for the sewage, showing that it is a failure. And all that "Radipole" may assert as to the concentration and expenditure will not do away with the fact "that the present concentration of the sewage into the harbour and backwater allows it to speak for itself both to nose and eyes."

Q.

ROOFING SLATES.

Sir,—Permit me through the medium of your valuable paper to ask the question as to the best way of nailing roofing-slates to the battens? The practice in my neighbourhood seems to be to hole the slate about 12 in. from the tail, for countesses, to get a lap of 4 in.; consequently the nails are only covered by one slate, and that only for a space equal to the lap. The practice in London and other parts of the country is to place the holes near the head of the slate, where the nails are covered with two slates instead of one, and the slate lies closer on the batten, and more firmly attached to the batten, and offers by far the greater chances for keeping out the wet and the nails from rusting. I hope some of your readers will be able to explain why so important an alteration has been made.

An Observer.

SAFETY LADDERS.

Sir,—I am greatly surprised that amidst the numerous inventions of modern times for the benefit of the human race no invention has yet appeared to afford greater security to those who have to work on ladders, such as bricklayers, painters, masons, &c. Now, when we consider how inadequate for security are the rounds of a ladder to a man standing on it, that he has no protection whatever from severe injury or death if he lets go that foothold, it does seem to me a matter of complete astonishment that no further protection can be afforded him, something in the shape of a safety belt or an endless chain or rope connected with the ladder, with a weight suspended on the inner side, to which a man may attach himself, so that, should he happen to slip, his descent would be gradual, and danger almost impossible. I do think, sir, that it is quite possible to make a safety-ladder, by which a man may work on it in security.

Joshua Rhodes.

OUR FOOTPATHS.

Sir,—A few months ago you inserted a letter from me upon the above subject, in which I drew the attention of your readers to the existence of the Footpaths Defence Association that had been formed for the express purpose of opposing the illegal inclosure of public footpaths and other rights of way. The publicity which my previous communication in the *Builder* gave the association has prompted me again to trespass upon your consideration. The society has, by timely interference, been successful in averting the threatened inclosure of several footpaths in various parts of the country. That such an association as the above was a *desideratum* is clearly shown by the fact that we have been overwhelmed with applications for advice and assistance; but the funds at the disposal of the committee being at present very small, we have not been in a position to respond to these calls in a manner that we wish to do in the future. The interest which has been awakened during the past two years in "Our Footpaths," and the consequent desire to preserve them, has resulted in the formation of permanent defence committees in two or three large provincial towns. There is a vast field of operation open to the association were the needful funds forthcoming; and I trust that those of your readers who are lovers of natural scenery will assist the consummation of the society's work by becoming members, especially as the subscription is merely nominal. In many of the country districts these footpaths were originally trodden because of the grand and beautiful scenery which they disclosed; and it is evident that if the people are deprived of the beaten ways over which they have wandered unmolested for generations, much of the beauty of nature will be denied them.

Although the general public have a special interest in these footways, and derive no little pleasure from their maintenance, yet, notwithstanding, the burden of opposing encroachments, &c., invariably falls upon impecunious local communities, who are frequently unable to raise the necessary funds, when, as a consequence, footpaths are closed with little opposition beyond a mere formal protest. The wrongs of the working classes have become such an unpalatable theme that to hint at them is the signal for inattention. The maintenance of our footpaths, however, although an estimable boon to rural populations, is a privilege which affects the whole community, and is not a benefit confined to any particular class.

I may mention that at the present time the inhabitants of a district in Cumberland are being tyrannised and deprived of their footways by one who is generally alluded to as "His Lordship." Of him it cannot be said "*Noblesse oblige.*"

James Geo. Buckle, Hon. Sec.
28, *Essex-street.*

Miscellanea.

Electric Lighting.—On the 25th ult., Prof. Tyndall gave evidence before the Select Committee appointed to consider the subject of electric lighting, Dr. Lyon Playfair presiding. The witness pointed out that the Voltaic battery had been proved to be too expensive a mode of producing electricity, as the waste of zinc plates and chemicals was so great. Oersted, Ampère, and Arago followed with inventions, and the analogy between electricity and magnetism was demonstrated. With regard to the amount of light a single Siemens machine was capable of giving, experiments conducted at the South Foreland had been made with a medium-sized machine, and the light given amounted in round numbers to 6,000 candles. An enlarged machine was then constructed, but it had not been brought very much into operation of late, for the reason that its power was so considerable that it required such great care to prevent combustion of the commutator. He did not think a 10,000-candle machine could be made to give 10 lights of 1,000 candles each. There was nothing in science or practice to show that they could divide the current in that way without losing a great deal of electricity. If the wires were not of equal conducting power there would be a great loss of electricity. Certain impurities were produced in the burning of gas, and though these impurities would be produced in the case of charcoal points, it would not be so much so as in the case of gas, for the reason that the oxygen of the air was not essential to the production of the electric light, which could be burnt with great splendour in a vacuum. Also the carbonic gas would be infinitely less in the one case than in the other; for in one case its presence was an accident, in the other a necessity. It might be possible that nitrous acid would be given off by the carbon points, and whether that would injure books more than gas was a question which deserved attention; at present, they had not sufficient experience of it to say. In reply to Mr. Puleston, witness said that although there were great difficulties in the way of Edison applying the electric light successfully to domestic purposes, one was hardly entitled to say he would not be able to overcome them.

Society of Engineers.—At a meeting of the Society of Engineers, held May 5th, Mr. R. P. Spice, president, in the chair, a paper was read by Mr. E. D. Barker, on "Hydraulic Continuous and Automatic Brakes." The author, in introducing the subject, pointed out the adaptability of hydraulic power for actuating railway brakes, and the advantages of its application in this respect. He then stated that in the first trains fitted with his hydraulic brakes, practice then only required that the brake should be worked by the guard, and not by the driver, although the latter was undoubtedly the right man to work the brake, and the author subsequently adapted his brake to suit the latter practice. The author then gave a short description of his earlier form of hydraulic brake, and a detailed description, illustrated with diagrams, of its latest development, viz., as an automatic as well as a continuous brake, and which arrangement, he stated, met all the Government requirements. It was stated that an express train on the Great Eastern Railway, fitted with the latest development, was in successful daily working. Attention was then called to the importance of being able to regulate the hydraulic pressure brought to bear on the brake-blocks,—brakes not only being required for emergencies, but for convenience of traffic. Taking into consideration the great desirability of diminishing the discomfort of passengers, the author contended that the more perfectly the power could be regulated, the more appropriate brakes became for the varied requirements of railway working, and that the hydraulic brake fulfilled the required conditions more perfectly than any other.

Royal Society.—The annual *conversazione* of the Royal Society was held on Wednesday evening, the 30th ult., at the rooms of the Society, Burlington House, when, in response to the invitation of the president and council, there was a brilliant assemblage. Many new inventions and works of art were exhibited. Mr. E. B. Bright exhibited models of his electric fire-alarm. A printed description furnished to the visitors stated that the report of the New York Fire Patrol Committee showed that the prompt announcement of fires had reduced the losses to the extent of 76 per cent. in houses provided with indicators, as against those not so provided. Mr. Bright showed the plan of the works he was arranging in the west district for the London Fire Brigade. His electric plan can be applied either to communication from street stations to the central or district office, or by automatic action from small instruments placed in each room of a house, when the heat caused by a conflagration affecting the coiling of a metal spring gives electric contact. Among the art objects bearing on natural history were some interesting vases from Japan, obtained by Mr. Gardner, F.G.S., from the Paris Exhibition. They are what are known as Satsuma ware, and illustrate the way in which the Japanese can faithfully represent fish, crabs, and other "lower forms" of life, even if they are not so successful with higher animals and the human form. The most remarkable of the Japanese work was a large slab stated to be the largest slab of real porcelain ever made.

Flashing Signals.—The operations in the Zulu war have called attention to the system of communicating intelligence by flashing signals, and have led to inquiries for information on the subject. We get the following from the *Engineer*:—"The transmission of light may be effected by different means. By day a mirror enables the reflected light of the sun to be flashed for a very great distance,—in the case of Ekowe, about thirty miles. The principal difficulty must lie in the fact that not only is it difficult to point the instrument truly on to an exact spot, but it is further necessary to keep it moving so as to correspond with the apparent motion of the sun. At Chatham there is a heliostat consisting of a plain mirror fixed on a theodolite stand, with a small hole through the centre of the mirror, and an arm, which has on it a sight. This sight can be pointed on the desired object, and the mirror continually turned so as to project its beams through it. These operations, however, can only be attempted when the sun is shining brightly. A much more reliable method can be adopted at night when a strong light is placed in the focus of a parabolic mirror, so that the beams are reflected in parallel rays in any desired direction. This is, of course, always available on a tolerably clear night. It is unlikely that the garrison of Ekowe had any regular instrument provided for the purpose. It is obvious, however, that it is easy to improvise one sufficiently good for practical purposes. The mirror to be employed for sunlight should, in the nature of things, be a simple plane,—a parabola being only suited to a light which can be fixed in its focus. The difficulty, of course, lies in the fact, already noticed, that the beam has to be accurately directed on the distant station, and kept there in spite of the apparent motion of the sun. Probably this is the reason that so much difficulty has been experienced in reading the signals. Without any pre-arrangement, well-directed signals would soon be read, inasmuch as the periods of flash would soon be observed to be systematic, and any intelligent soldier who has been instructed in telegraphy, would be able to read them."

Author's Remuneration.—An American journal says,—"Milton received $25 for 'Paradise Lost.' Pope $40,000 for his translation of 'Homer.' Edgar Allan Poe, $10 for 'The Raven,' his most famous poem. Dr. Holland, $12,000 for 'Bitter Sweet'; $8,000 for 'Katrina'; and $5,000 for the 'Mistress of the Manse.' Mr. Bonner, of the *Ledger*, paid Tennyson $5,000 for a single poem. Augusta Evans Wilson, author of 'Beulah,' has made $100,000 in eight years, out of her novels. Sir Walter Scott made $259,000 out of his. Bret Harte received $10,000 for 'Gabriel Conroy.' Dickens, $15,000 for the copyright of 'Barnaby Rudge' for six months. Stanley has already received $50,000 for his 'Through the Dark Continent.' Shakspeare got $25 for 'Hamlet.' Boucicault, $150,000 for 'The Shaughraun.'".

Visit of the Architectural Association to St. Paul's Cathedral.—On Saturday afternoon last a large number of the members of the Architectural Association visited St. Paul's Cathedral, where they were met by Mr. Penrose, and under his guidance conducted over the building. The carving of the upper part of the stalls of the choir, in oak and lime-tree wood, by Grinling Gibbons, was seen to advantage, the brightness of the sunlight revealing to many for the first time the remarkable variety of expression in the cherubs' faces. Dean Milman's monument, by Williamson, and that of Bishop Blomfield, by George Richmond, R.A.,—who has in this work shown his skill as a sculptor as well as a painter,—were pointed out. The Munich windows in the apse were, Mr. Penrose remarked, not calculated to be seen with good effect from a distance, but on a near view they had merits which, he thought, ought to be acknowledged. The wrought-iron gates by Tijou having been pointed out, the visitors descended into the crypt, of which they found an increased space open to the public. The Duke of Wellington's funeral car has been removed from its former position near the great sarcophagus in which is entombed the body of the "Iron Duke," to the extreme west end of the crypt, and a considerable portion of the floor has been covered with marble mosaic pavement. The morning chapel at the east end of the crypt was glanced at, and having visited "The Artists' Corner" to see the grave of Wren, the members ascended to the nave and thence to the triforium, library, and dome. Before leaving they inspected the remains of the chapter-house of Old St. Paul's, found last year to the south of the present cathedral. These remains will be carefully covered over and preserved. By the alterations now in progress in the "churchyard," the massive iron railings on the south side of the cathedral have been set back some 7 ft. or 8 ft., making room for the provision of a footpath,—an improvement which has long been needed at this spot.

Paris Decorations.—Some weeks ago it was announced that Mlle. Alice Regnault had sold her hotel, in the Rue Balzac, to M. Michel Popoff, the Commissary of the Russian section of the Universal Exhibition, the furniture having gone by the hammer. The hotel was open to the public for the inspection of the furniture, and the *salons* and *chambres* were filled with the curious, for, as Mlle. Regnault is celebrated for her excellent taste and style in dress, it was interesting to see how she employed these gifts in furnishing her dwelling. The walls of the *salons* were in black and gold, the armchairs and lounges covered with most delicate stuffs. The dining-room, in black and green, opened into a large glass-covered room or conservatory, the walls of which were covered with a brilliant chintz, as were the *canapés* that encircled each end. In the centre was a carved and gilded sleigh (Louis XV.) filled with flowers, forming an odd and original *jardinière*. The state bed-chamber was princely, the walls being hung with garnet satin and heavy *portières* of the same, and a canopied bed, about 7 ft. wide, stood in the centre, the hangings and coverlid also of garnet satin; the light was subdued by Chinese screens at the windows, and the rich mantle ornaments and works of art distributed about added to the luxury of the chamber. The dressing-room was large and well appointed, and the bath-room, with all the modern conveniences, would have pleased the eyes of a newly-arrived American. — *The Parisian.*

Stamp Duty Notice.—A notice has just been issued by the Commissioners of Inland Revenue in regard to the law regulating the stamp duty on agreements for letting furnished houses and apartments for terms less than a year. "The law requires," the notice states, "that such agreements shall be stamped either before or at the time of execution (*i.e.*, of signature), and imposes a penalty of 5*l.* on any person who executes, or prepares or is employed in preparing, any such agreement which is not duly stamped before or at the time of execution, in addition to a penalty of 10*l.* which may be imposed on stamping the agreement. An unstamped agreement cannot be enforced in any court of justice." The scale of duties is as follows:—Where the rent for the whole term does not exceed 5*l.*, 6d.; exceeding 5*l.*, but less than 10*l.*, 1s.; exceeding 10*l.*, but less than 15*l.*, 1s. 6d.; exceeding 15*l.*, but less than 20*l.*, 2s.; exceeding 20*l.*, 2s. 6d.

Liverpool Builders' and Property-owners' Association. — The third annual dinner of this Association was held on the 25th ult., the president, Mr. W. O. Elias, in the chair. After the removal of the cloth, the secretary, Mr. O. Owens) read the annual report, which showed the Association to be in a highly prosperous condition, a large number having been added to the list of members during the past year. The election of officers for the ensuing year was proceeded with, the president (Mr. W. O. Elias) being re-elected by acclamation. The question of the reduction of wages was regarded with considerable interest, and sympathy with the operatives was frequently expressed. It was satisfactory to know that the joiners and bricksetters had reasonably regarded the necessity for the notice given by the employers six months since, and that terms had been comfortably arranged without semblance of strike or dispute. Great firmness was, however, manifested in reference to the masons and plasterers, who have not as yet concluded terms, and the necessity for reducing the bricklayers' and plasterers' labourers' wages was regarded as urgent. The whole matter was by resolution referred to the newly-elected committee, who were also requested to specially direct their attention to the assimilation of the hours of labour in all the various branches in the trade.

"Wilkinson's Improved Roof Tile."—The aim of the patentee here has been to furnish a tile roof of about the same weight as a slate roof, and to make the tiles superior in finish to any other tile in the market. Thus by using the patent tiles it is urged that a fourth in carriage is saved, also the timber is not required to be so strong. There is a bevel on the bottom to make them appear thin and neat; also a continuous nib for security, and to make the tile lie true. The tile looks not over-strong, but the proprietor guarantees it to be strong enough, to wear as long as any other tiles that are made, and to be thoroughly impermeable. They are to be seen on the Streatham Public Hall, Alperton Schools, a house at Oakleigh Park, Great Western Railway, Haggerston-road Schools, and the Middle-class College, Hereford, where they have given satisfaction.

The Albert Medal.—The council of the Society of Arts attended on Tuesday at Marlborough House, when his Royal Highness the Prince of Wales, as president of the society, presented to Sir William George Armstrong, F.R.S., the Albert Medal awarded to him "because of his distinction as an engineer and as a scientific man, and because, by the development of the transmission of power,—hydraulically,—due to his constant efforts, extending over many years, the manufactures of this country have been greatly aided, and mechanical power beneficially substituted for most laborious and injurious manual labour.

Public Baths for Chippenham.—At a meeting of the Chippenham Local Board, held on Monday evening last, the plan of their surveyor, Mr. Lightfoot, for the erection of public baths in the town, was ordered to be sent to the Local Government Board for approval. The Board are borrowing money for the erection of the building, under the Baths and Wash-houses Act.

TENDERS

For the erection of laundry and swimming-bath at Southall Schools, for the Guardians of St. Marylebone. Messrs. H. Saxon Snell & Son, architects:—

Crockett	£4,000 0 0
Wall, Bros.	3,977 0 0
Kearley	3,689 0 0
Howard	3,675 0 0
Taylor	3,590 0 0
Woodbridge	3,575 0 0
Aldin & Sons	3,554 0 0
Jones & Co.	3,540 0 0
Beauchamp	3,450 0 0
Gibson (accepted)	3,420 0 0

For four cottages at Deal, for Mr. D. M. Hill. Mr. Edward W. Fry, architect. No quantities:—

Bourne	£960 0 0
Knight	902 17 0
Redman	869 0 0
Gibbons (accepted)	856 15 0

For farm buildings, cottage, &c., for the Trustees of the Leith Estate, Walmer, Kent. Mr. Edward W. Fry, architect. Quantities by the architect:—

Petts & Son	£2,780 0 0
Stiff	2,716 0 0
Bourne	2,375 0 0
W. & T. Deane	2,199 0 0

For additions to entrance-lodge, Stoke Farm, for Lord Alexander Gordon Lennox. Mr. Arthur Vernon, architect:—

Silver (accepted)	£189 0 0

For the erection of Workmen's Club, Woburn-green, Bucks, for Mr. Alfred Gibbey. Mr. Arthur Vernon, architect:—

Williams	£854 0 0
Silver	853 0 0
Child	761 0 0
Taylor & Grist (accepted)	752 10 0

For alterations and additions at Hillside, Wimbledon, for the Rev. C. J. Wynne. Mr. Geo. McDonell, architect:—

Shaw (accepted).

For boundary-wall and other works at Polegate, for Mrs. Carter. Mr. Amos Crisford, architect:—

Stevens	£337 0 0

Accepted for addition, &c., to Cromwell House, Stockwell Park-road, Brixton, for Mr. W. T. Wiseman:—

Maxwell, Bros.	£196 0 0

For the erection of two houses, and for sundry alterations to three houses, Addington-square, Camberwell, for Mr. Goodyear. Mr. H. Moxon, architect:—

Goad	£1,247 0 0
Baker	1,151 0 0
G. & T. Fisher	975 0 0
Shapley	895 0 0
Perkis	799 0 0

For building schools and teachers' residence, St. Matthew's, Surbiton. Mr. C. L. Luck, architect. Quantities by Messrs. Northcott, Son, & Neighbour:—

	Stone.	Brick.
Sease	£3,776	£3,456
Mudie	3,673	3,449
Clemence	3,670	2,980
Vare	3,300	2,947
Hockley	3,400	3,110
Manley	3,201	2,947
Hook & Oldrey	2,980	2,712
Adkins	2,900	2,640
Jarvis	2,795	2,595

For a pair of small semi-detached houses at Goldworth, near Woking Station, Surrey. Mr. Henry Peak, architect:—

Pratt & Son	£739 0 0!
Clark	650 0 0
Garnett	647 0 0
Whitburn	600 0 0
Butt (accepted)	515 0 0
Harris	493 0 0
Martin, Wells, & Co.	480 0 0!

For new school buildings at Wyke, near Guildford. Mr. Henry Peak, architect:—

Swayne (accepted)	£500 0 0

For a detached house and stable, &c., at Hooke Heath, Woking, Surrey. Mr. Henry Peak, architect:—

Whitburn	£1,550 10 0
Clark	1,530 0 0
Garnett	1,336 0 0
Harris	1,175 0 0
Martin, Wells, & Co.	1,049 0 0
Butt (accepted)	1,045 0 0

For additions and alterations at No. 96, High-street, Guildford. Mr. Henry Peak, architect:—

Smith (accepted)	£865 7 11

For new building in the Walworth-road. Messrs. Lander & Bedells, architects:—

Body	£2,031 6 0
Williams & Son	1,857 0 0
Brown	1,760 0 0
Grover	1,604 0 0
Elkington	1,569 0 0
Marsland	1,555 0 0
Downs	1,485 0 0

For ten cottages at Bexley. Mr. Rickwood, architect:—

Hills (accepted)	£1,342 0 0

For Wesleyan Chapel, Plumstead-road. Mr. Rickwood, architect. Quantities supplied:—

Wilkins	£1,271 0 0
Tongue	1,235 0 0
Johnson	1,175 0 0

For house, Wrottesley-road, Plumstead. Mr. Rickwood, architect:—

Johnson	£1,600 0 0
Harris	1,138 0 0
Wilkins (accepted)	1,075 0 0

For pair of houses, Upper Eglinton-road, Plumstead. Mr. Rickwood, architect:—

Johnson	£1,800 0 0
Harris	1,285 0 0
Wilkins (accepted)	1,135 0 0

For house, Plumstead Common-road. Mr. Rickwood, architect. Quantities supplied:—

Kirk & Randall	£1,195 0 0
Tongue	1,106 0 0
Harris	985 0 0
Wilkins (accepted)	735 0 0

For tank and retaining wall, &c., Sevenoaks, for the Sevenoaks Gas Company. Mr. A. Penney, C.E. Quantities supplied by Mr. W. H. Barber:—

White	£2,673 0 0
Matthews	2,240 10 0
Tibbitt & Adams	2,170 10 0
Botterill (accepted)	2,140 0 0

For the erection of the "Mary Fletcher" Memorial Chapel at Leytonstone, Essex. Mr. Charles Bell, architect. Quantities by Mr. Henry Lovegrove:—

Hobson	£5,045 0 0
Woodward	4,940 0 0
Lucas & Son	4,566 0 0
Staines & Son	4,560 0 0
Hunt	4,560 0 0
Hook & Oldrey	4,529 0 0
Stephenson	4,512 0 0
Tarrant & Son	4,500 0 0
Bangs & Co.	4,498 0 0
Nibbett	4,478 0 0
Chessum	4,424 0 0
Morter	4,367 0 0
Gregar	3,939 0 0

For rebuilding No. 123, New Bond-street, and premises in Lancashire-court. Mr. Marks, architect. Quantities by Mr. Shoppee:—

Laing & Son	£6,047 0 0
Conder	4,990 0 0
Colls & Son	4,170 0 0
Bywaters	4,675 0 0
McLachlan & Sons	4,510 0 0
Macey	4,500 0 0
Braid & Co.	4,490 0 0
Brass	4,377 0 0
Shaw	4,360 0 0

For the first portion of a large church to be erected in the Albert-road, Battersea Park. Mr. William White, architect. Quantities supplied by Mr. E. Crutchloe:—

Adamson & Sons	£6,464 0 0
Browne & Robinson	6,085 0 0
Patman & Fotheringham	5,976 0 0
Dove Bros.	5,870 0 0
Lathey Bros	5,803 0 0
Macey & Sons	5,735 0 0

For new aisle, &c., to St. Paul's Church, Loxden, Colchester:—

Gozzett	£1,367 10 0!
Gardner & Son	1,033 0 0
Dobson	985 0 0
Garwood	859 15 11
Grimes	753 7 6!

For alterations at the Marlborough Head, Marlborough-road, Peckham, for Mr. Pearce. Mr. W. Nunn, architect:—

Evered	£787 0 0
Lamble	727 0 0
Auley	676 0 0
Grimwood & Sons	583 0 0

For two warehouses in Heneage-street, St. Mary Axe. Mr. Robert J. Worley, architect:—

Toms (accepted)	£2,815 0 0

For alterations and repairs at the Victoria Tavern, South Tottenham. Mr. F. Fred. Holsworth, architect:—

Mark	£980 0 0
Drew	873 0 0
Toms	840 0 0

For alterations and repairs at the Rodney Head, Pentonville, for Messrs. Combe & Co. Mr. Henry R. Cotton, architect:—

Toms (accepted)	£243 0 0

Bar Fittings.

Toms (accepted).

For repairing, painting, &c., at 221, New Cross-road. Mr. Henry R. Cotton, architect:—

Harris	£235 0 0
McLachlan	223 0 0
Toms (accepted)	178 0 0

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